```
Result
                                                                                                                                                                                                                                                                                                                                                                                                            Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Total number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Perfect score:
                                                                                                                                                             ŏ.
  10
11
12
13
14
15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     on:
                                                                                                                                                                                                       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
          2821
2725
2721.5
2720.5
2720.5
2720.5
2719
2637.5
2687.5
2587.5
2587.5
2587.5
2587.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
Bd
                                                                                                                                                                                                                                                                                                                                                                                                            ..
                                                                                                                                                             Score
                                                                                                                                           2988
                                                                                                                                                                                                                                                                                                                                                                                                                                                               seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             O.f.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          length:
                                                                                                                                          100.0
                                                                                                                                                                    Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-771-382-10
2988
1 MNKIYRIIWNSALNAN
                                                                                                                                                                                                                                                 9:
10:
11:
12:
13:
14:
15:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           hits satisfying chosen parameters:
                                                                                                                                                             Match
                                                                                                                                                                                                                                                                                                                                                                                                                           Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
 SPTREMBL_19:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              562222 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gapop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    July
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVAVS.....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                             sp_rvirus:*
sp_bacteriap:*
sp_archeap:*
                                                                                                                                                                                                                                                                                                                        sp_phage: *
                                                                                                                                                                                                                                                                                                                                  sp_organelle:*
                                                                                                                                                                                                                                                                                                                                          sp_mhc:*
                                                                                                                                                                                                                                                                                                                                                                                        sp_bacteria:*
                                                                                                                                                                                                                                                                                                                                                                                                 sp_archea:*
                                                                                                                                                                                                                                                                                                                                                    sp_mammal:*
                                                                                                                                                                                                                                                                                                                                                             sp_invertebrate:*
                                                                                                                                                                                                                                                                                                                                                                      sp_human:*
                                                                                                                                                                                                                                                                                                                                                                               sp_fungi:*
                                                                                                                                                                                                                                                                         sp_unclassified:*
                                                                                                                                                                                                                                                                                   sp_vertebrate:*
                                                                                                                                                                                                                                                                                             sp_virus:*
                                                                                                                                                                                                                                                                                                      sp_rodent:*
                                                                                                                                                                                                                                                                                                             sp_plant:*
                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2000000000
 5992
5992
5992
5994
5994
5994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2002, 08:48:11; Search time 100.13 Seconds (without alignments) 1022.800 Million cell up
                                                                                                                                                             BB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                172994929 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gapext 0.5
; 09JOW4
09JPS9
09JOY2
09JPS5
09JPS6
09JPSR
09JPS7
                                                                                                                                                            IJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sw model
                                                                                                                                                                                         SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                alignments)
Million cell updates/sec
Q9jqW4
Q9jpyS9
                                                                                                                                                            Description
o neisseria m
                                                                                                                                         neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              592
```

45	44	43	42	41	40		38		36	35 5	34	<u>ω</u>	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
211.5	212	214	214	219	220.5	224.5	226.5	233.5	252	261.5	267.5	365	375.5	394.5	410.5	441.5	1132.5	1135	2248.5	2250.5	2443	2445.5	2460.5	2464.5	2502	2521	2524	2530
7.1	7.1	7.2	7.2	7.3	7.4	7.5	7.6	7.8	8.4	8.8	9.0	12.2	12.6	13.2	13.7	14.8	37.9	38.0	75.3	75.3	81.8	81.8	•	82.5	83.7	84.4	84.5	84.7
892	1417	2065	873	1018	3930	1557	989	1265	1004	1953	1291	2712	1107	1190	2059	1299	2353	1098	530	526	592	591	591	591	600	598	598	598
N	16	N	N	16	16	N	N	N	16	16	16	16	N	16	16	16	N	N	2	Ν	2	N	N	16	N	N	N	2
Q9KX38	Q9HVN6	Q93DC7	Q9L960	Q9НWU6	Q98E20	Q9RNI2	Q9XD84	Q9FDA0	Q9PD63	Q98нJ2	Q92KQ7	Q9F3X5	Q9F2D8	Q9PC04	Q9PD50	Q9F3X6	P71401	Q48152	Q9JPS1	Q9JPS4	Q9AQF0	Q93QY3	Q9JPS7	Q9JR18	Q9JPS6	Q93QY5	Q9JPS0	Q9JPT0
Q9kx38 moraxella c	Q9hvn6 pseudomonas	Q93dc7 yersinia en	Q91960 moraxella c	Q9hwu6 pseudomonas	Q98e20 rhizobium l	Q9rni2 haemophilus	Q9xd84 escherichia	Q9fda0 xanthomonas	Q9pd63 xylella fas		Q92kq7 rhizobium m	Q9f3x5 pasteurella	Q9f2d8 salmonella		Q9pd50 xylella fas	Q9f3x6 pasteurella	P71401 haemophilus		Q9jpsl neisseria m	Q9jps4 neisseria m	Q9aqfO neisseria m	Q93qy3 neisseria m	Q9jps7 neisseria m	Q9jr18 neisseria m	Q9jps6 neisseria m	Q93qy5 neisseria m	Q9jpsO neisseria m	Q9jptO neisseria m

## ALIGNMENTS

```
RESULT
Q9JQW4
     MEDLINE-2022556; PubMed-10761919;
Parkhill J., Achtman M., James K.D., Bentley S.D., Churcher C.,
Klee S.R., Morelli G., Basham D., Brown D., Chillingworth T.,
Davies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Holroyd
Jagels K., Leather S., Moule S., Mungall K., Quail M.A.,
Rajandream M.A., Rutherford K.M., Simmonds M., Skelton J.,
Whitehead S., Spratt B.G., Barrell B.G.;
"Complete DNA sequence of a serogroup A strain of Neisseria
meningitidis 22491.";
Nature 404:502-506(2000).
[2]
Nature FROM N.A.
STRAIN=205900, BZ133, F6124, AND Z2491;

MEDLINE=20175756; PubMed=10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9JQW4;
01-OCT-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
01-DEC-2001 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-Z2491
                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis (serogroup A), and Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NMA1200 OR GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PUTATIVE SURFACE FIBRIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JQW4
                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=65699,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                         / SEROGROUP A / SEROTYPE 4A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15, Created)15, Last sequence update)19, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROTEIN (OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ⋧
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNA992).
                                                                                                           Nuti S.,
                                                                                                                                                                                                                                                                                                                                       s;
```

2;

```
RESULT
Q9JPS9
                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                       멍
                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RL DR DR DR DR DR DR DR SQ
                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                        밁
                                                                                                                                                                                        뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Science 287:1816-1820(2000).
EMBL; AL162755; CAB84461.1; -.
EMBL; AF226357; AAR42506 1; -.
EMBL; AF226365; AAF42514.1; -.
EMBL; AF226365; AAF42522.1; -.
EMBL; AF226373; AAF42522.1; -.
EMBL; AF226386; AAF42535.1; -.
Complete proteome.
SEQUENCE 592 AA; 61745 MW; A
                                                                                               Q9JPS9 PREI
Q9JPS9;
01-OCT-2000 (TrI
01-OCT-2000 (Tri
01-MAR-2001 (Tri
0UTER MEMBRANE I
SEQUENCE FROM N.A.
STRAIN=860800;
MEDLINE=20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V.
Comanducci M., Jennings G.T., Baldi
                                                          Neisseria meningitidis.
Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                        GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                y Match
: Local Similarity
ches 592; Conserv
                                                                                                                                                                                        541
                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                             Ν
                                                                                                                                                                                                                                                            NINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPV
                                                                                                                                                                                                                                                                                              VRTYDTVEELSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                GIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDF
                                                                                                                                                                                                                                                                                                                                                                                                                                         NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ESVQRSVVGSIQASMEGSGELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNINENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RITHVAPGVKEGDYTHVAQLKGYAQNLHHRIDHVDGHARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                     VRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                        GIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDF
                                                                                                                                                                                        MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                 MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                0 (TrEMBLrel.
0 (TrEMBLrel.
1 (TrEMBLrel.
RANE PROTEIN G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           100
                                                                                                 .. 15, Cr
.. 15, La
.. 16, La
.. 16, La
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .0%;
                                                                      beta
                                                                                                        Created)
Last seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2988;
Pred. No. 5.6
); Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AD22E2F5EEF8F754 CRC64;
                                                                      subdivision;
                                                                                                         sequence up
annotation
         Giuliani N
L., Bartol
                                                                                                                                             592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .6e-120;
                                                                                                         on update)
                                                                                                                                             A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DΒ
                                                                      Neisseriaceae;
          M.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16;
         щ÷
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
               Arico'
          rico' B.,
Capecchi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       592;
                                                                                                                                                                                        592
                                                                                                                                                                                                          592
                                                                       Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
          ₩
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                420
                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
```

```
RESULT
Q93QY2
ID Q0
AC Q0
DT 00
DT 00
DT 00
DT 00
DT 00
C D0
C C D0
RP 00
RP 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Galeotti C.L., Luzzi E., Manetti R., Marchetti E.
Ratti G., Santini L., Savino S., Scarselli M., Sil
Broeker M., Hundt E., Knapp B., Blair E., Mason 1
Hood D.W., Jeffries A.C., Saunders N.J., Granoff Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Seimeningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226301; AAF42510.1;
SEQUENCE 592 AA; 61917 MW; 4A3471514FD3C879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                    Q93QY2;
Q93QY2;
01-DEC-2001
01-DEC-2001
01-DEC-2001
NHHA OUTER M
SEQUENCE FRO STRAIN=H41; Peak I.R., S
                                                    Neisseria meningitidis.
Bacteria; Proteobacteri
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                 539
                                                                                                                                                                                                                                                                                                                                                539
                                                                                                                                                                                                                                                                                                                                                                                  479
                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                                                                                                                                                                                                                                                                                                      419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            y Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \mathbf{L}
                                                                                                                                                                                                                                                             ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ESVQRSVVGSIQASMEGSGELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT
                                                                                                                                                                                                                                                                                                             GIGSTLTDTLAGSSASHVDAGNOST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQSENV
                                                                                                                                                                                                                                                                                                                                                                              DFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGRGKGENG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLYTGKGKGENG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity 94.
                                   FROM
   Srikhanta
                                                                                                                                        MEMBRANE
                                                                                                                                                      (TrEMBLrel. (TrEMBLrel. (TrEMBLrel.
                                                                                                                                                                                                                             PRELIMINARY;
                                  N.A.
                                                                                                                                      rel. 19, rel. 19, rel. 19, rel. 19, protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              94.48;
 Υ.,
                                                                                      ia;
   Dieckelman
                                                                                      beta
                                                                                                                                                        Last
Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2821; D
Pred. No. 7.2e
9; Mismatches
                                                                                                                                                                                          Created)
                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4A3471514FD3C879
                                                                                      subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R., Marchetti E., Mor
Scarselli M., Storni I
Blair E., Mason T., Tei
rs N.J., Granoff D.M.,
                                                                                                                                                        sequence update)
annotation update)
   .
.
                                                                                                                                                                                                                                592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 2;
7.2e-113;
nes 17;
   Moxon
                                                                                        Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Serogroup
   ₽.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mora M
   Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Tettelin H
M., Venter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a M.,
Zuo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
   M. P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Nuti
                                                                                           Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4.
                                                                                                                                                                                                                                                                                                                                                     592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -SDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                          478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                       538
                                                                                                                                                                                                                                                                                                                                                                                                                       538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    238
```

4.

```
8
                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ΔÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SORRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Ma
Best Loc
Matches
                                                                                                                              01-OCT-2000
01-OCT-2000
01-MAR-2001
0UTER MEMBRA
GNA992.
MEDLINE=20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
                                                  STRAIN=E32;
MEDLINE=20175756;
                                                                                                         Neisseria
Bacteria;
                                                                                                                                                                                  Q9JPS5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Identification and characterization of a gene membrane protein of Neisseria meningitidis.", Submitted (JUN-1999) to the EMBL/GenBank/DDBJ EMBL; AF157609; AAK68870.1; -. SEQUENCE 592 AA; 61869 MW; F9403A0B4A18EEP
                                                                          SEQUENCE FROM
                                                                                               NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                  539
                                                                                                                                                                                                                                                                      539
                                                                                                                                                                                                                                                                                           479
                                                                                                                                                                                                                                                                                                                479
                                                                                                                                                                                                                                                                                                                                    419
                                                                                                                                                                                                                                                                                                                                                         419
                                                                                                                                                                                                                                                                                                                                                                                                     359
                                                                                                                                                                                                                                                                                                                                                                                                                          299
                                                                                                                                                                                                                                                                                                                                                                                                                                              299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                               359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
les 558; Conser
                                                                                                                                                                                                                                                                                                                                  NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                       TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                     SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                               GIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQSENV
                                                                                                                                                                                                                                                           KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                         TVSKDDQGNTTVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--SDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ESVQRSVVGSIQASMEGSGELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
                                                                                                                                                                                                                                                 KSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT
                                                                                                                                         MEMBRANE
                                                                                                          meningitidis.
Proteobacteria;
                                                                                                                                                   O (TrEMBLrel.)
O (TrEMBLrel.)
O (TrEMBLrel.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                              PRELIMINARY;
                                                                          N.A.
                                                                                                                                         PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          93.0%;
                                                                                                                                         GNA992.
                                                                                                                                                    15,
16,
                                                                                                           beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 2779; D
Pred. No. 4.4e
9; Mismatches
                                                                                                                                                   Created)
Last sequences
Last anno
                                                                                                          subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      F9403A0B4A18EEA7
                                                                                                                                                   sequence update) annotation update)
                                                                                                                                                                                              600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        a gene encoding
dis.":
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .4e-1
                                                                                                                                                                                            ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DВ
                                                                                                           Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ] <sub>2</sub>;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               novel
                                                                                                           Neisseria
                                                                                                                                                                                                                                                 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                outer
                      Ø
                                                                                                                                                                                                                                                                                                                                                        478
                                                                                                                                                                                                                                                                                                                                                                                                  418
                                                                                                                                                                                                                                                                                                                                                                                                                                             358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
```

```
RESULT
Q9JPHO
ID
AC
Q9JPHO
OS
AC
OS
DT
OI

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ΔÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SQ RT RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Ma
Best Loc
Matches
                                                                                                                              Q9JPH0;
Q9JPH0;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                 OUTER N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Hood D.W., Jeffries A.C., Saunders N.J., Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Agameningococcus by Whole-Genome Sequencing Science 287:1816-1820(2000).

EMBL; AF226372; AAF42521.1; SEQUENCE 600 AA; 62606 MW; 13C35F1C46
SEQUENCE FROM
STRAIN=528, AN
                                NCBI_TaxID=487; [1]
                                                                 Neisseria meningitidis
Bacteria; Proteobacter
                                                                                                                                                                                                                                                                                  600
                                                                                                                                                                                                                                                                                                               592
                                                                                                                                                                                                                                                                                                                                                 540
                                                                                                                                                                                                                                                                                                                                                                                532
                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Match
                                                                                                                                                                                                                                  G
                                                                                                               CT-2000 (TrEMBLrel. 1)
CT-2000 (TrEMBLrel. 1)
AR-2001 (TrEMBLrel. 1)
R MEMBRANE PROTEIN GN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Σ
                                                                                                                                                                                                                                                                                                               Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ESVQRSV-VGSIQASMEGSGELETISLSMTNDSKEFVDPYIV----VTLKAGDNLKIKQ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGDTTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  il Similarity
549; Conser
                                                                                                                                                                                                                                                                                  600
                                                                 Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              91.2%;
91.3%;
                                                                                   L, Created)
15, Last sec.
16, Last ar
N GNA992.
                                                                 beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    13C35F1C46392524
                                                                 subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                  sequence u
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2725;
No. 8.
                                                                                                                                                                                                    595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Against
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2;
8.8e-109;
les 29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Granoff D.M.,
                                                                                                                                                                                                 Ã
                                                                                                                                on update)
                                                                 Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Venter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   10;
                                                                  Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                   599
                                                                                                                                                                                                                                                                                                                                                                                591
                                                                                                                                                                                                                                                                                                                                                                                                                  539
                                                                                                                                                                                                                                                                                                                                                                                                                                                 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  291
```

```
RESULT
Q9JPS8
ID Q9
AC Q9
AC Q9
DT 01
DT 01
DT 01
DT 01
OE 00
GN GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN GN
GN G
                                                                                                                                                                                                                                                                                                                     B 8
                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
A Moxon E.R., Grandi G., Rappuoli R.,
Tidentification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226356; AAF42505.1; -.
EMBL; AF266356; AAF42505.1; -.
SEQUENCE 595 AA; 62120 MW; 8212C96380142BFC CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query
Best I
                                                                                              OJPSB;

01-OCT-2000 (TrEMBLrel. 15, Created)

01-OCT-2000 (TrEMBLrel. 15, Last sequence update)

01-MAR-2001 (TrEMBLrel. 16, Last annotation update)

OUTER MEMBRANE PROTEIN GNA992.
           Neisseria meningitidis.
Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                                                                                                                                          09JPS8
                                                                              GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                     540
                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                μ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ESVQRS-VVGSIQASMEGSGELET---ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNT
                                                                                                                                                                                                                                                                                                                                                                                                                               NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGTAQATATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DETVNINĀGNNIEISRNGKNIDIATSMAPQFSSVSLGAGĀDAPTLSVDDEGALNVGSKDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EPVVRSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHG-ATVTLKAGDNLKIKQNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DENTNASSFTYSLKKDLTDLTSVGTEELSFGANGNKVNLTSDTKGLNFAKKTAGTNGDTT
                                                                                                                                                                                                                                                                                                                                                                                                      NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         546;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             91.1%;
                                      beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 2721.5;
Pred. No. 1.2e.
14; Mismatches
                                                                                                                                                                                                            PRT;
                                      subdivision;
                                                                                                                                                                                                            599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .5; DB 2;
l.2e-108;
nes 31;
                                                                                                                                                                                                            B
                                      Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                      Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5
                                                                                                                                                                                                                                                                                                                     595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           w
             RESULT
Q9JPR7
ID Q9
AC Q9
DT 01
DT 01
                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                              B
             Q9JPR7;
Q9JPR7;
01-OCT-2000
01-OCT-2000
```

```
RP SEQUENCE FROM N.A.

RP SEQUENCE FROM N.A.

RESTRAIN=A22;

RX MEDLINE-20175756; PubMed-10710308;

RX MEDLINE-20175756; PubMed-10710308;

RA Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' b.,

RA Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' b.,

RA Comanducci M., Jennings G.T., Baldi L., Bartollini E., Capecchi B.,

RA Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

RA RATTI G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

RA Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

RA Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

RA MOXON E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

RI Science 287:1816-1820(2000).

DR EMBL; AF226364; AAF42513.1; .

SEQUENCE 599 AA; 62693 MW; 46C2E974AF7F78E9 CRC64;

7720.5; DB 2; Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local s
Matches 549
                                                             536
                                                                                                                                                                                            416
                                                                                                                                                                                                                                                                                                                                                                                                                                                              176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         116
596
                              589
                                                                                                                                                                469
                                                                                                                                                                                                                               409
                                                                                                                                                                                                                                                               356
                                                                                                                                                                                                                                                                                              349
                                                                                                                                                                                                                                                                                                                              296
                                                                                                                                                                                                                                                                                                                                                                                             236
                                                                                                                                                                                                                                                                                                                                                                                                                            229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GYQW
                              GYOW
                                                                                                                                                                                            AGTNGDTTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ESVQR-SVVGSIQASMEGSGELETISLSMTNDS------KEFVDPYIVVTLKAGDNLKI
                                                              AGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASV
                                                                                AGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASV 588
                                                                                                                             LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                               LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                            AGTNGDTTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KONTDENTHASSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KQ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EPVKRTAVVLSFRSDKEGTGEKE-----VTEDSHWGVYFDEKGVLKAGTITLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tch 91.0%; al Similarity 90.9%; 549; Conservative 1
                              592
599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 2720.5; I
Pred. No. 1.4e-1
5; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         s.
                                                                                                                                                                                                475
                                                                                                                                                                                                                               468
                                                                                                                                                                                                                                                                 415
                                                                                                                                                                                                                                                                                               408
                                                                                                                                                                                                                                                                                                                                355
                                                                                                                                                                                                                                                                                                                                                              348
                                                                                                                                                                                                                                                                                                                                                                                               295
                                                                                                                                                                                                                                                                                                                                                                                                                             288
                                                                                                                                                                                                                                                                                                                                                                                                                                                              235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                  595
                                                                                                                                 535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4
```

PRELIMINARY;
(TrEMBLrel.
(TrEMBLrel.

15, 15,

Created)

sequence

```
RESULT
Q9JPIO
ID Q9
AC Q9
                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                     밁
                                                                õ
                                                                                     В
                                                                                                 Qy
                                                                                                                      밁
                                                                                                                                  γQ
                                                                                                                                                       밁
                                                                                                                                                                       δ
                                                                                                                                                                                          밁
                                                                                                                                                                                                      20
                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                          ٠,٥
                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                     ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                     WEDLINE-20175756; PubMed=10710308;

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Caleotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Mhole-Genome Sequencing.";

RI Science 287:1816-1820(2000).

RE SEQUENCE 598 AA; 62431 MW; 0881CC094F33B4D4 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                        Query Ma
Best Loc
Matches
Q9JPIO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-MAR-2001
OUTER MEMBRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria
                                                     539
                                                                                      479
                                                                                                                        419
                                                                                                                                         413
                                                                                                                                                         359
                                                                                                                                                                           353
                                                                                                                                                                                            299
                                                                                                                                                                                                             293
                                                                                                                                                                                                                              239
                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                 179
                                                                                                                                                                                                                                                                                173
                                                                                                                                                                                                                                                                                                  119
                                                                                                                                                                                                                                                                                                                   115
                                                                                                                                                                                                                                                                                                                                                                                                                Z Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                      61
                          œ
                                                   KGKMDETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                       GKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                         GKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNYTFAS
                                                                                                                                                                                                                            GQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                        GDTTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTT
                                                                                                                                                                                                                                                                                                                                              ESVQRSV-VGSIQASMEGSGELETI---SLSMTNDSKEFVDPYIVVTLKAGDNLKIKQ---
                                                                                                                                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                              SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                      SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                GDTTVHLNG I GSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTT
                                                                                                                                                                                                                                                                                                  DENTDENTNASSFTYSLKKDLTDLTSVETEKLSFGANGKKVNITSDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                    EPVQRTAPVLSFHADSEGTGEKEVIGNTNLGIYFDEKRVLKAG-TITLKAGDNLKIKQNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEMBRANE
                                                                                                                                                                                                                                                                                                           NTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (TremBLrel. 16, Last annotation ANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                91.0%;
91.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      beta
                                                                                                                                                                                                                                                                                                                                                                                                         13;
                                                                                                                                                                                                                                                                                                                                                                                                                Score
Pred.
          PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                2719;
No. 1
          589
                                                                                                                                                                                                                                                                                                                                                                                                        ; DB 2;
1.6e-108;
hes 27;
         A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tettelin H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              apecchi B.,
M., Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                         10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ρ.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       O
                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                          412
                                                                    592
                                                                                                                        478
                                                                                                                                                         418
                                                                                                                                                                                                           352
                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                232
                                                                                                                                                                                                                                                                                                  178
                                                                                                                                                                                                                                                                                                                                                    114
                                                                                                                                                                                                                                                                                                                                                                       59
                                                                                     538
                                                                                                                                                                                           358
                                                                                                                                                                                                                             298
                                                                                                                                                                                                                                                               238
                                                                                                                                                                                                                                                                                                                                                                                                        5
                             Ş
                                                   В
                                                                ΩV
                                                                                    В
                                                                                                  Qy
                                                                                                                      멍
                                                                                                                                   δÃ
                                                                                                                                                       В
                                                                                                                                                                       Qy
                                                                                                                                                                                           В
                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                             QY
                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                 δ. B
                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Sim
Matches 533;
                  534
                                                    474
                                                                    477
                                                                                      414
                                                                                                     417
                                                                                                                       354
                                                                                                                                        357
                                                                                                                                                                                           234
                                                                                                                                                                                                            237
                                                                                                                                                                                                                              174
                                                                                                                                                                                                                                              177
                                                                                                                                                                                                                                                                118
                                                                                                                                                         294
                                                                                                                                                                          297
                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                     \vdash
                                                                                                                                                                                                                                                                 1
```

```
REDIENCE FROM N.A.

REDIENCE FROM N.A.

RESTRAIN-MGP165, 90,718311, AND 93/4286;

REDIENCE-20175756; PubMed-10710308;

REDIENCE-20175756; PubMed-107756;

REDIENCE-20175756; PubMed-107756;

REDIENCE-2017576;

REDIENCE-20175766;

REDIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-OCT-2000 (Tri
01-OCT-2000 (Tri
01-MAR-2001 (Tri
01TER MEMBRANE I
GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Prote
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                     NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ESVQRS-VVGSIQASMEGSGELET---ISLSMINDSKEFVDPYIVVTLKAGDNLKIKQNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                     DETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                   PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                  NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ESVVRSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHG-ATVTLKAGDNLKIKQ--
PGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                                                  {\tt NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLAQAYL}
                                                                                                                                                                                                                                                                     DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                88.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                beta subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2637.5; DB 2
Pred. No. 4.6e-105;
2; Mismatches 40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       11;
589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                     473
                                                                                                                                                                                                                                                                                                                                                                                                            413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           353
```

4.

```
RESULT
Q9JPR8
ID Q9
AC Q9
DT 01
                                                                                                                               QΥ
                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                              DЪ
                                                                                                                                                                                                                                                                                               QУ
                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                       80
                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                       ᄝ
                                                                                    QΥ
                                                                                                              В
                                                                                                                                                       Ъ
                                                                                                                                                                        δÃ
                                                                                                                                                                                             Db
                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Ma
Best Loc
Matches
Q9JPR8;
Q9JPR8;
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Identification and characterization of a gene encoding membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157610; AAK68871.1; -...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               093QY1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AHHN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NHHA.
                                                                                                               474
                                                                                                                                    477
                                                                                                                                                        414
                                                                                                                                                                           417
                                                                                                                                                                                              354
                                                                                                                                                                                                                    357
                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                           297
                                                                                                                                                                                                                                                                               234
                                                                                                                                                                                                                                                                                                   237
                                                                                                                                                                                                                                                                                                                       174
                                                                                                                                                                                                                                                                                                                                           177
                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Match
Local Similarity
                                         10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                      MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OUTER
                                                                               PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                         NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                      TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSFSKGKM
                                                                                                                                                                                                                                     NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT
                                                                                                                                                                                                                                                                             VHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSE
                                                                                                                                                                                                                                                                                                                                                                        ESVQRS-VVGSIQASMEGSGELET---ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNT
                                                                                                                                                                                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                              TATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                                                                                                     VHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSE
                                                                                                                                                                                                                                                                                                                                                                                                      ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHG-ATVTLKAGDNLKIKQ--
                                                                       PGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                             NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYL
                                                                                                                                                                                                                                                                                                                                                              SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01 (TrembLrel. 19, 01 (TrembLrel. 19, 01 (TrembLrel. 19, 01 (TrembLrel. 19, R MEMBRANE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              87.9%;
89.1%;
 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last
Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2626.5;
Pred. No. 1.3e
13; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence update)
annotation update)
                    599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .5; DB 2;
1.3e-104;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                    A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ×
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         טי
                                                                                          592
                                                                      589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               outer
                                                                                                                                                                                                                                                                                                                                                                                  176
                                                                                                              533
                                                                                                                                                                                              413
                                                                                                                                                                                                                   416
                                                                                                                                                                                                                                                          356
                                                                                                                                                                                                                                                                                                                                         236
                                                                                                                                                                                                                                                                                                                                                             173
                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                       353
                                                                                                                                                                                                                                                                               293
                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4:
```

```
Qy
                                                                                                                                            QΥ
                                                                                                                                                                          망
                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                         DЪ
                                                                                                                  밁
                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ρþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=NGH38;

MEDLINE=20175756; PubMed=10710308;

MEDLINE=20175756; PubMed=10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Brocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoll R.,

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Peak I.R., Srikhanta Y., Dieckelman M., Moxon R "Identification and characterization of a gene membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ d EMBL; AF226383; AAF42532.1; -. EMBL; AF157608; AAK68869.1; -. EMBL; AF157608; AAK68869.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GNA992 OR NHHA.
Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-OCT-2000 (TrEMBLrel
01-DEC-2001 (TrEMBLrel
OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-H38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=487;
[1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria;
                            471
                                                                                                                   358
                                                                                                                                               351
                                                                                                                                                                             298
                                                                                                                                                                                                        291
                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                  231
                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                                                                                                                                    115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity 88.0 nes 530; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKGKGENGSSTDEGEGLYTAKEYIDAYNKAGWRMKTTTANGQTGQADKFETYTSGTNYTF
                                                                                                                                                                                                                                                     TTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                             GDTTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGS
                                                                      PSKGKMDETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                  ASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                 ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                           GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                       TA--SDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                               GDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                         NKNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                                                        --NTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                                                                                                EPVVRSALVLQFMIDKEGNGENESTGNIGWSIYYDNHNTLHG-ATVTLKAGDNLKIKQNT
                                                                                                                                                                                                                                                                                                                                                                                                                                  ESVQRS-VVGSIQASMEGSGELET---ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 19, Last annotation updat
ANE PROTEIN GNA992 (NHHA OUTER MEMBRAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              86.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2587.5; DE Pred. No. 6.3e-10 15; Mismatches 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BBA16EBF53C1970C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               D .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ι Β.,
ι S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               outer
                                                                                      470
                                                                                                                                             410
                                                                                                                                                                                                                                                                                                                            230
                                                                                                                                                                                                                                                                                                                                                         179
                                                                                                                                                                                                                                                                                                                                                                                    172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                         477
                                                                                                                   417
                                                                                                                                                                             357
                                                                                                                                                                                                        350
                                                                                                                                                                                                                                       297
                                                                                                                                                                                                                                                                  290
                                                                                                                                                                                                                                                                                               239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6
```

```
RESULT

OPEN

OPEN
Ş
                                                                                      Š
                                                                                                                                                밁
                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Sin
Matches 523;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-20175756; PubMed=10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OUTER MEMBRANE PROTEIN GNA992.

Neiserair
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q9JPI3;
01-OCT-2000 (TrEMBLrel. 15,
01-OCT-2000 (TrEMBLrel. 15,
01-MAR-2001 (TrEMBLrel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; AF226376; AAF42525.1; -. EMBL; AF226369; AAF42518.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A. STRAIN-NG3/88, AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9JРІЗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Meningococcus by Whole-Genome Sequencing. Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               538
                                                                                                                                                                                                                                                                                              231
                                                                                                                                                                                                                                                                                                                                              175
                                                                                                                                                                                                                                                                                                                                                                                                                                         115
  411
                                                  353
                                                                                                351
                                                                                                                                                   293
                                                                                                                                                                                              291
                                                                                                                                                                                                                                              235
                                                                                                                                                                                                                                                                                                                                                                                              173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                       GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                              TA--
                                                                                                                                                                                                                                                                       TTGQSENVDFVRTYDTVEELSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                        GDTTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGS
PSKGKMDETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALN
                                                                      ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                             GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF
                                                                                                                                                                                                                                                                                                                                            GDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EPVQRTAPVLSFHADSEGTGEKE-----VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ESVQRSV-VGSIQASMEGSGELETISLSMTNDS-----KEFVDPYIVVTLKAGDNLKI 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 599
                                                                                                                                                                                                                                              -SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ą,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BZ232;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62086 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            85.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2553; DB 2;
Pred. No. 1.8e-101;
3; Mismatches 43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1B25E03B90D04B46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseriaceae; Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                             410
                                                                                                                                                                                                                                                                                                                                                                                                                                       174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            590
                                                                                                                                                                                              350
                                                                                                                                                                                                                                         292
                                                                                                                                                                                                                                                                                           290
                                                                                                                                                                                                                                                                                                                                            234
                                                                                                                                                                                                                                                                                                                                                                                         230
                                                                                                                                                352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
```

```
RESULT
Q9JPH7
ID Q9
DT O11
RN Ne
COX
RN NE
RN NE
RN SEEN
RN GA
RA BIT
RN GA
RN 
                                                                                                             Qy
                                                                                                                                                             g
                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                     Вр
                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                       20
                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Peak I.R., Srikhanta Y., Dieckelman M., Moxon R "Identification and characterization of a gene membrane protein of Neisseria meningitidis."; Submitted (JUN-199) to the EMBL/GenBank/DDBJ d EMBL; AF226368; AAF42517.1; -. EMBL; AF226358; AAF42507.1; -. EMBL; AF57604; AAK68865.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' Commanducci M., Jennings G.T., Baldi L., Bartolini E., Cape Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettel Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Ven Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-BZ198, AND 297-U;
STRAIN-BZ198, AND 297-U;
MEDLINE-20175756; PubMed=10710308;
MEDLINE-20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q9JPH7;
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis.
Bacteria, Proteobacteria,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GNA992 OR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  09лрн7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          531
                       171
                                                                       113
                                                                                                                  111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             413
                                                                                                                                                               60
                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                     -
                                                                                                                                                                                                                                                                                                  سر
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TNGDTTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKT
                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8 =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               å
                                                                                            KIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAG
                                                                                                                                                                                                                                                  MNKIYRIIMNSALNAWVVVSELTRNHTKRASATVATAVLATLLEATVQANATD-DDDXLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KIKQNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                               EPVQRTAVVLSFRSDKEGTGEKEG - - - -
                                                                                                                                                                                                     ESVQR-SVVGSIQASMEGSGELETISLSMTNDSKEFVDPYI------VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               592
                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 19, Last annotation update)
ANE PROTEIN GNA992 (NHHA OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA;
                                                                                                                                                                                                                                                                                                                                                                  85.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               62361 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15,
19,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  beta
                                                                                                                                                                                                                                                                                                                                                  16;
                                                                                                                                                                                                                                                                                                                                             Score 2552; D
Pred. No. 2e-1
16; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created
                                                                                                                                                                                                                                                                                                                                                                                                                                                               436BDDED68263C5C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               subdivision;
                                                                                                                                                             -TEDSNWAY--YFDEKRYLKAGAITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                     2552; DB 2;
No. 2e-101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseriaceae; Neisseria
                                                                                                                                                                                                                                                                                                                                                  42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  encoding
                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Jennings
coding a n
                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Tettelin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Arico'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Capecchi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Zuo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        м.р.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                  22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               s.
                                                                                                                                                               112
                                                                                                                                                                                                                                                       59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  530
                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 472
                                                                                                                                                                                                                                                                                                                                                  7;
```

Š

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                    Š
                                               밁
                                                                    Qy
밁
                                                                                               Query Ma
Best Loc
Matches
                                                                                                                                                                                                                       SEQUENCE FN....

STRAIN-NGE31;

MEDLINE-20175756; PubMed=10710308;

MEDLINE-20175756; PubMed=10710308;

MEDLINE-20175756; PubMed=10710308;

Mischanducci M., Scarlato V., Massignani V., Giuliani M.M., Arico' b.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nu
Galeotti C.L., Luzzi E., Manetti R., Mason T., Tettelin

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Venter
                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                Galeotti C..., Marcia Galeotti G., Santini L., Savino S., Scarselli M., Ratti G., Santini L., Knapp B., Blair E., Maso Broeker M., Hundt E., Knapp B., Blair E., Maso Hood D.W., Jeffries A.C., Saunders N.J., Grano Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against "Identification by Whole-Genome Sequencing.";
                                                                                                                                                             Meningococcus by Whole-Genome Sequencing. Science 287:1816-1820(2000).
EMBL; AF236379; AAF42528.1; -.
SEQUENCE 594 AA; 62114 MW; 1E2A63A78F
                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                         GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                   OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPS2
                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            229
                                                                                                 Local Similarity
mes 522; Conserv
60
                       61
                                                -
                                                                                                                        Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                             LNYGSKDANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNRIDNYDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTTA--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                       ESVQRSV-VGSIQASMEGSGELETISLSMTNDS-----KEFVDPYIVVTLKAGDNLKI
EPVQRTAPVLSFHADSEGTGEKE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                594
                                                                                                                                                                                                                                                                                                                                                                                                                                 (TrEMBLrel.
                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                   PROTEIN
                                                                                                            85.3%;
86.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                  1. 15, Create
1. 15, Last :
1. 16, Last :
N GNA992.
                                                                                                                                                                                                                                                                                                                                                                               beta
                                                                                                 18;
                                                                                               Score 2549; D
Pred. No. 2.7e
18; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Created)
                                                                                                                                                                                                                                                                                                                                                                               subdivision;
                                                                                                                                                              1E2A63A78F53D256
                                                                                                                                                                                                                                                                                                                                                                                                                               sequence up
 -VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  594
                                                                                                              .7e-101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A
                                                                                                                                                                                                                                                                                                                                                                                                                               update)
on update)
                                                                                                                           DВ
                                                                                                                                                                                                                                                                                                                                                                               Neisseriaceae;
                                                                                                  44;
                                                                                                                                                                                                             Serogroup
                                                                                                                                                                CRC64;
                                                                                                                        Length
                                                                                                 Indels
                                                                                                                                                                                                                                                                                        Arico' B.,
                                                                                                                                                                                                                В
                                                                                                  18;
                                                                                                                                                                                                                                                                          Chi B.,
Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                Neisseria
                                                                                                                                                                                                                                        H.,
                                                                                                                                                                                                                                                             Ρ.,
                                                                                                 Gaps
                        112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    350
                                                                                                 6
```

Ş

ب

MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL

Query Match Best Local S Matches 524

Local Similarity les 524; Conserv

85.0%; nilarity 86.2%; Conservative 1

16;

Score 2541; E Pred. No. 5.9e 6; Mismatches

; DB 2; 5.9e-101; hes 42;

26;

Gaps

60

Length Indels

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                           뭐
                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                    Q9JPR9;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                        MEDLINE-20175756; PubMed-10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                 GNA992.
Neisseria meningitidis.
Bacteria; Proteobacteri
NCBI_TaxID=487;
                                                                                                                                                                                                                                                              Q9JPR9
 Meninýococcus by Whole-Genome Science 287:1816-1820(2000).
EMBL; AF225482; AAAF42531.1; ". SEQUENCE 598 AA; 62718 MW;
                                                                                                                                      STRAIN-NGH36
                                                                                                                                                                                                           OUTER MEMBRANE
                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          113
                                                                                                                                                                                                                                                                                                                                                                                                   473
                                                                                                                                                                                                                                                                                                                                                                                                                      471
                                                                                                                                                                                                                                                                                                                                                                                                                                           413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      115
                                                                                                                                                                                                                                                                                                                  593
                                                                                                                                                                                                                                                                                                                                      591
                                                                                                                                                                                                                                                                                                                                                           533
                                                                                                                                                                                                                                                                                                                                                                                                                                                              411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 291
                                                                                                                                                                                                                                                                                    14
                                                                                                                                                                                                                                                                                                                                                         WQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                 Q.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TA--SDNYDFYRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                  594
                                                                                                                                                                                                                                                                                                                                     592
                                                                                                                                                                             Proteobacteria;
                                                                                                                                                                                                           (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence up
(TrEMBLrel. 16, Last annotation
and PROTEIN GNA992.
                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                              beta
                                ndidates Against
Sequencing.";
                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                             subdivision;
   9095F8E31AD7C76D CRC64;
                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                     update)
                                                                                                                                                                               Neisseriaceae;
                                                                                                                                                                              Neisseria
                                                                                  P.,
                                                                                              s;
                                                                                                                                                                                                                                                                                                                                                             592
                                                                                                                                                                                                                                                                                                                                                                                590
                                                                                                                                                                                                                                                                                                                                                                                                                        530
                                                                                                                                                                                                                                                                                                                                                                                                                                             472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       174
                                                                                                                                                                                                                                                                                                                                                                                                     532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      292
```

```
RESULT
Q93QY4
   DЬ
                 Qy
                                                                                                                                                                                                                                                                                                                                                                 οy
                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                맑
                                          Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                               01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                              STRAIN=EG327;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel of membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.

SEMBL, AF157605; ARK688661; -
SEQUENCE 594 AA; 62297 MW; 9DDD48B04B3A8EA2 CRC64;
                                                                                                                                                                                                                                                                                Q93QY4
Q93QY4;
                                                                                                                                                                                                      Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                           NCBI_TaxID=487;
                                                                                                                                                                                                                              NHHA.
                                                                                                                                                                                                                                                                                                                                                                    585
                                                                                                                                                                                                                                                                                                                                                                                                                                 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            113
                                                                                                                                                                                                                                                                                                                                                591
                                                                                                                                                                                                                                                                                                                                                                                         531
                                                                                                                                                                                                                                                                                                                                                                                                                                                      465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                111
                                                                                                                                                                                                                                                                                                                                                                                                            525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                     Match
Local Similarity
                                                                                                                                                                                                                                                                                                                15
                                                                                                                                                                                                                                    EC-2001 (TIEMBLIE1. 19, Created)
EC-2001 (TIEMBLIE1. 19, Last sequence up
EC-2001 (TIEMBLIE1. 19, Last annotation
OUTER MEMBRANE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                      KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK 166
SASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DGKLYTGKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTS 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GVKTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ETAGTNGDTTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                    SASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTNVTFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTNVTEASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GVKPGTTA--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EPVQRTAVVLSFRSDKEGTGEKEG-----TEDSNWAV--YFDEKRVLKAGAITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ESVQR-SVVGSIQASMEGSGELETISLSMTNDSKEFVDPYI------VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DGKLVTGKGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTS
                                           Conservative
                                                                                                                                                                                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                               598
                                                                                                                                                                                                                                                                                                                                                                   592
                                                   84.8%;
                                                                                                                                                                                                      beta
                                           20;
                                          Score 2533; DI
Pred. No. 1.3e
20; Mismatches
                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                     subdivision;
                                                                                                                                                                                                                                                           sequence update)
                                                                                                                                                                                                                                                                                           594
                                                    33; DB 2;
1.3e-100;
                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                      Neisseriaceae;
                                                                                                                                                                                                                                               update)
                                                              Length 594;
                                                                                                                                                                                                      Neisseria
                                           18;
                                          Gaps
                                                                                                                                        outer
  59
                     60
                                                                                                                                                                                                                                                                                                                                                                                                          584
                                                                                                                                                                                                                                                                                                                                                                                                                                530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59
                                           6
```

```
Дb
                                                                                                                                                                            Ş
                                                                                                                                                                                                                             Ъ
             80
                               В
                                            Qγ
                                                              В
                                                                            Qy
                                                                                             뫄
                                                                                                           δÃ
                                                                                                                              В
                                                                                                                                            Ş
                                                                                                                                                                                             DЬ
                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                           Ş
593
               591
                               533
                                               531
                                                               473
                                                                               471
                                                                                              413
                                                                                                              411
                                                                                                                                                              293
                                                                                                                                                                                              235
                                                                                                                                                                                                                              175
                                                                                                                                                                                                                                                              115
                                                                                                                                                                                                                                                                             113
                                                                                                                              353
                                                                                                                                              351
                                                                                                                                                                              291
                                                                                                                                                                                                              231
                                                                                                                                                                                                                                              173
                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                            61
                                       LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHEGASASVGY
                                                                                              PSKGKMDETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                             8-8
-8
                                                                                                                                      ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                     GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                       VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                              GKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                               LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                              VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAG
                                                                                                                              ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                               590
                                                                532
                                                                                              472
                                                                                                               470
                                                                                                                               412
                                                                                                                                                              352
                                                                                                                                                                              350
                                                                                                                                                                                                                              234
                                                                                                                                                                                                                                                              174
                                                                                                                                                                                                                                                                             172
                                                                                                                                                                                              292
                                                                                                                                                                                                              290
                                                                                                                                                                                                                                              230
```

Search completed: July 3, 2002, 08:48:13 Job time: 704 sec

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                         Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Run on:
                                                                                                                                                                                                                                                                                             NO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein -
   Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                    2971.5
2971.5
2971.5
2758.5
2758.5
2740.5
2740.5
2740.5
2725.5
2725.5
                                                                                  2685
2685
2573.5
2573.5
2479
                                                                                                                                                                                                                                                                                              Score
                                                                                                                                                                                                                                                                3003
3003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  length:
                                                                                                                                                                                                                                                                                             Query
Match
                                                                                                                                                                                                                                                                                                                                                                                          6.54321
   July 3, 2002, 08:01:28; search time 64.11 Seconds (without alignments) 225.168 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Issued_Patents_AA:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      231628 seqs, 24425594 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BLOSUM62
Gapop 10.0 , Gapext 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-771-382-1
3003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GenCore version Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MNKIYRIIWNSALNAWVVVS....
                                                                                                                                                                                                                                                                                                                                                                                     /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/BCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20000000000
   DB
 US-09-377-155-21
US-09-669-974-21
US-09-377-155-12
US-09-377-155-2
US-09-377-155-2
US-09-669-974-9
US-09-669-974-155-7
US-09-669-974-155-15
US-09-69-974-155-15
US-09-69-974-155-15
US-09-377-155-15
US-09-377-155-17
US-09-377-155-33
US-09-377-155-33
US-09-377-155-33
US-09-377-155-33
US-09-377-155-33
US-09-377-155-33
US-09-377-155-33
US-09-378-347-35
US-09-378-347-35
US-09-378-347-35
US-09-378-347-47
US-08-409-995-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sw model
                                                                                                                                                                                                                                                                                                                              SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4.5
                                                                                                                                                                                                        Sequence 21,
Sequence 11,
Sequence 11,
Sequence 2, A
Sequence 2, A
Sequence 2, A
Sequence 9, A
                                                                                                                                                                                                                                                                                              Description
                    sequence
                                                                                                                                                                                     Sequence
                                                                                                                                                                                                 Sequence
11 Appli
2 Appli
2 Appli
3 Appli
7 Appli
7 Appli
7 Appli
7 Appli
7 Appli
7 Appli
13 Appli
15 Appli
15 Appli
15 Appli
17 Appli
                                                                                                      Ъ
                                                                                                                        Qγ
                                                                                                                                               밁
                                                                                                                                                                 á
                     밁
                                        Ş
                                                              밁
                                                                                 Q
                                                                                                                                                                                        밁
                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                181
                                                                                  181
                                                                                                       121
                                                                                                                           121
  TDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV 360
```

45 70	44 7,		42	41										31 107			
700.5	745.5	756.5	999	999	13.5	13.5	43.5	61.5	1061.5	51.5	51.5	51.5	51.5	1074.5	84.5	34.5	34.5
23.3	24.8	25.2	33.3	33.3	34.7	34.7	34.7	35.3	35.3	35.3	35.3	35.3	35.3	35.8	39.4	39.4	39.4
1104	1002	1004	679	679	658	658	658	1098	1098	1098	1098	1098	1098	1094	1912	1912	607
4	4	4	4	4.	4	w	ب	4	4	4	4	w	۲	4	w		4
US-09-268-347-28	US-09-268-347-24	US-09-268-347-30	US-09-268-347-26	US-08-913-942-15	US-08-913-942-5	US-08-685-467-5	US-08-409-995-5	US-09-268-347-44	US-09-669-974-32	US-08-913-942-2	US-09-377-155-32	US-08-685-467-2	US-08-409-995-2	US-09-268-347-32	US-08-685-467-4	US-08-409-995-4	US-08-913-942-6
Sequence 28, Appl	Sequence 24, Appl	Sequence 30, Appl	Sequence 26, Appl	Sequence 15, Appl	Sequence 5, Appli	Sequence 5, Appli	Sequence 5, Appli	Sequence 44, Appl	Sequence 32, Appl	Sequence 2, Appli	Sequence 32, Appl	Sequence 2, Appli	Sequence 2, Appli	Sequence 32, Appl	Sequence 4, Appli	Sequence 4, Appli	Sequence 6, Appli

## ALIGNMENTS

; TYPE: PRT; ORGANISM: Neisseria meningitidis US-09-377-155-21 US-09-377-155-21 SOFTWARE: Pa SEQ ID NO 21 LENGTH: 591 Sequence 21, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Ansell FILE REFERENCE: 065064/0128
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12 Query Match 100.0%; Best Local Similarity 100.0%; Matches APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE APPLICANT OF THE PROPERTY OF THE PEACE APPLICANT O NUMBER OF SEQ ID NOS: NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN 180 GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS GIGSTLTDTLLNTGATTNYTNDNYTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNYDF VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS 591; PatentIn Ver. 2.0 Conservative SURFACE ANTIGEN 0; Score 3003; DB 4; Pred. No. 2.7e-225; Mismatches Length Indels

591; 0;

Gaps

0

240 240

```
δÃ
                                                                                                           В
                                                                                                                                       Qy
                                                                                                                                                                        밁
                                                                                                                                                                                                     80
                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                   δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
             Qy
                                               В
                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 2
US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
Matches 591; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN Ver. 2.0
SEQ ID NO 21
LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 21, Appli
Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM: Neisseria
-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: PEAK, Ian Richard Ansel
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: PRT
                                                                                                             181
                                                                                                                                          181
                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541 MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
              301 TDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNVTFASGKGTTATV
                                                                                                                                                                           121
                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                    1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                             GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                           GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                        NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN 180
                                                                                                                                                                                                                                                      YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TDEGEGLYTAKEYIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNYTFASGKGTTATY
                                                                                                                                                                        NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                      YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION:
Application US/09669974
                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                           meningitidis
                                                                                                                                                                                                                                                                                                                                                                             100.0%;
                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                              Score 3003; DB 4;
Pred. No. 2.7e-225;
); Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                             591;
                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                           300
                                                                                                                                       240
                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                 360
                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                              0
```

```
δÃ
ρ
                                DЬ
                                                         δÃ
                                                                                               뫄
                                                                                                                            ρ
                                                                                                                                                                멍
                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                            20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; ORGANISM: Neisseria meningitidis US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 199-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 3
US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 11, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 588; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQ ID NO 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: PEAK, Ian Richard Anse.
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH: 591
                                301
                                                               301
                                                                                               241
                                                                                                                              241
                                                                                                                                                                181
                                                                                                                                                                             181 GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
361
                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                 61 YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                                                                                                                                                                                                                                                                                                                               1 MNEILRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                              1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                            VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NINAGNNIEITRNGKNIDIATSMTPQFSSYSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SKDDQGNITYMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                                                                                YLDPVLRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TDEGEGLYTAKEYIDAYNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV
                                                                                                                                                                                                                                 NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                            99.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                           Score 2984; DB 4;
Pred. No. 8.1e-224;
""smatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           540
                                                                360
                                                                                                 300
                                                                                                                               300
                                                                                                                                                                                               240
                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
```

٠,

```
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN Ver. 2.0
SEQ ID NO 11
                                                                                                                                                                                                                            20
                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
               Ş
                                          밁
                                                                 δõ
                                                                                            멍
                                                                                                                    δÃ
                                                                                                                                                 밁
                                                                                                                                                                         δÃ
                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                       ORGANISM: Neisseria
US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 588; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 11, Appl. Patent No. 633317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: MOVEL SURFACE ANTIGEN
FILLE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH:
                361
                                          301
                                                                    301
                                                                                              241
                                                                                                                        241
                                                                                                                                                   181
                                                                                                                                                                            181
                                                                                                                                                                                                        121
                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                    NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                      YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                        TDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV
                                                                                            VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                         VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                                                                                                                                                                           YLDPVLRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                               MNEILRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                          TDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Application US/09669974
                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                   meningitidis
                                                                                                                                                                                                                                                                                                                                                                              99.4%;
                                                                                                                                                                                                                                                                                                                                                                 Score 2984; DB 4;
Pred. No. 8.1e-224;
1; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                            DB 4; Length
                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        591
                                                                                                                                                                                                                                                                                                                                                                 0,
                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          480
                                                                                                                                                                           240
                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                 360
                                                                                                                                                 240
                                                                                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                          360
                                                                                            300
                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                 0;
                                                  Q
                                                                                В
                                                                                                       20
                                                                                                                                                           Q
                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                     DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                          В
                                                                                                                                   망
                                                                                                                                                                                       밁
                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
 420
```

```
; TYPE: PRT
; ORGANISM: Neisseria
US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOFTWARE: Pa
SEQ ID NO 2
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 2, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 586;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION NUMBER:
PRIOR FILING DATE: 1997-1
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FILE REFERENCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                 301
                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                           300
                                                                                                                                       241
                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                                                                                                                          LYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIK 119
                                                                                                                                                                                          NGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVD
                                                                                                                                                                                                                                             NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV 420
VNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPV
                           VSKDDQGNITYMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET
                                         VSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET 419
                                                                                                                                        FVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGVKTSVIKEKDGKLVTGKDKGENGS
                                                                                                                                                  FVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGS
                                                                                                                                                                                                                                                                                                        LYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                              99.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GB 9726398.2
                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2971.5; DB 4;
Pred. No. 7.6e-223;
3; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      591
                                                                                                                                                                                                                                                                                                                                                                                                                  1;
                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        540
 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             480
                           42C
                                                                                                             359
                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             540
                                                                                 360
                                                                                                                                        300
                                                                                                                                                                  299
                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                  1;
```

```
Š
                                                                                                               В
                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                 Ъ
                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 6
US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
             Qy
                                                 B
                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                   뮹
                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; ORGANISM: Neisseria meningitidis US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQ ID NO 2
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 2, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421 VNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPV
                  420
                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity 99.0%;
les 586; Conservation
                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                    L
                                                                                                               STDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTEASGKGTTAT
                                                                                                                                                                                                                                                                                                              RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKS
                  VNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPV
                                                                 VSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET
                                                                                                                                                                                 FVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGVKTSVIKEKDGKLVTGKDKGENGS
                                                                                                                                                                                                    FVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGS
                                                                                                                                                                                                                                                NGIGSTLIDTILLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVD 239
                                                                                                                                                                                                                                                                                                                                                                                                  LYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIK 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLEATVQASANNEE-QEED 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RITHVAPGVKEGDVTHVAQLKGVAQNLHNRIDHVDGHARAGIAQAIATAGLVQAYLPGKS 540
                                                                                                                                                                                                                                                                                                                                                                                   LYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIK
                                                 VSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET
Score 2971.5; DB 4
Pred. No. 7.6e-223;
3; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 4; Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  μ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 539
                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ۲,
```

```
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999.08-1099
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 9
   밁
                             δÃ
                                                                   밁
                                                                                                Q
                                                                                                                                 å
                                                                                                                                                               Q
                                                                                                                                                                                                   В
                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; LENGTH: 594
TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 7
US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Sim
Matches 552;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: PEAK, TAR
APPLICANT: JENNINGS,
APPLICANT: MOXON, E.
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 9, Application US/09377155 Patent No. 6197312
   417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                   357
                                                                                                    355
                                                                                                                                   297
                                                                                                                                                                  295
                                                                                                                                                                                                   237
                                                                                                                                                                                                                                    235
                                                                                                                                                                                                                                                                     177
                                                                                                                                                                                                                                                                                                      175
                                                                                                                                                                                                                                                                                                                                       117
                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                       58
KMDETVNINAGNNIEITRNGKNIDIATSMTPQESSVSLGAGADAPTLSVDGD-ALNVGSK 473
                                                                 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKS 539
                                                                                                                                                   GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK 354
                                                                                                                                                                                                                     SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK 294
                                                                                                                                                                                                                                                                   TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                     TTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 234
                                                                                                                                                                                                                                                                                                                                       NTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD
                                                                                                                                                                                                                                                                                                                                                      -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD 174
                                                                                                                                                                                                                                                                                                                                                                                                         YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ 116
                                                                                                                                                                                                                                                                                                                                                                                                                      YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPV
                                                                                                                                     GENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                   SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PEAK, Ian Richard Anselm
JENNINGS, Michael Paul
MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NOVEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       91.9%; Score 2758.5; DB 4; 92.3%; Pred. No. 2.7e-206; tive 14; Mismatches 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                   416
                                                                                                    414
                                                                                                                                                                                                                                                                     236
                                                                                                                                                                                                                                                                                                                                         176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                     356
                                                                                                                                                                                                     296
```

4

δÃ

474

KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA

```
Qy
                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                   뭥
                                                                                                                                                                                                                                                                                                       οy
                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                 망
           8
                                      В
                                                          Š
                                                                                    В
                                                                                                       Qy
                                                                                                                                  Дb
                                                                                                                                                                                   В
                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 9
LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 552; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sequence 9, Application Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORGANISM: Neisseria meningitidis -09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: PRT
                                                                                                                                                                                                                                    177
                                                                                                                                                                                                                                                            175
                                                                                                                                                                                                                                                                                    117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          534
              474
                                      417
                                                                                     357
                                                                                                            355
                                                                                                                                    297
                                                                                                                                                            295
                                                                                                                                                                                     237
                                                                                                                                                                                                            235
                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  477
                                                                                                                                                                                                                                                                                                                                    58
                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                  YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK
                                                                                                                                                           GENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                              TTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                   NTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD
                                                                                                                                                                                                                                                                                                -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD 174
                                                                                                                                                                                                                                                                                                                                 YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                                                                                                                                                                                                   TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                             91.9%;
92.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   us/09669974
                                                                                                                                                                                                                                                                                                                                                                                                                                  14;
                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2758.5;
Pred. No. 2.7e
14; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                             5; DB 4;
1.7e-206;
                                                                                                                                                                                                                                                                                                                                                                                                                                  21;
                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                 11;
                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                           414
                                                                                                                                                                                                          294
                                                                                                                                                                                                                                                          234
                                                                                                                                                                                                                                                                                  176
                                                                                                                                                                                                                                                                                                                                  116
                                                                                                                                                                                                                                                                                                                                                                                 57
                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                    356
                                                                                                                                                           354
                                                                                                                                                                                   296
                                                                                                                                                                                                                                   236
                                                                                                                                                                                                                                                                                                                                                                                                                                 4.
                                                                                                                      밁
                                                                                                                                             δÃ
                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                             Ωy
                                                                        밁
                                                                                             ρy
                                                                                                                                                                       멍
                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                           QУ
```

```
; ORGANISM: Neisseria meningitidis US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
APPLICANT: PEAK, I
APPLICANT: JENNING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 7, Applia Patent No. 619731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE:
SEQ ID NO 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: PEAK Ian Richard
APPLICANT: JENNINGS, Michard
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SUF
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH: 594
TYPE: PRT
                                                                    417
                                                                                                                                        357
                                                                                                                                                                           355
                                                                                                                                                                                                              297
                                                                                                                                                                                                                                                 295
                                                                                                                                                                                                                                                                                  237
                                                                                                                                                                                                                                                                                                                    235
                                                                                                                                                                                                                                                                                                                                                        177
                                                                                                                                                                                                                                                                                                                                                                                        175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                               551;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA 533
                                                                                      KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK 473
                                                                                                                                                         GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                       TTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                          -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 591
DTNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                                      KMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSK 476
                                                                                                                                        GTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                        PTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                             NTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNHIDNYDGNARAGIAQAIATAGLYQA 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Application
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          91.3%; Score 2740.5; DB 4;
92.1%; Pred. No. 6.7e-205;
92.1%; Mismatches 25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US/09377155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Paul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                              356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       57
                                                                                                                                        416
                                                                                                                                                                           414
                                                                                                                                                                                                                                                 354
                                                                                                                                                                                                                                                                                    296
                                                                                                                                                                                                                                                                                                                                                        236
                                                                                                                                                                                                                                                                                                                                                                                                                               176
                                                                                                                                                                                                                                                                                                                     294
```

4.

534

YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 591

```
Qy
                                                                                                    В
                                                                                                                             Qy
                                                                                                                                                        В
                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
4 04
                                              망
                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 7, Application Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE: PRT
ORGANISM: Neisseria
-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH: 594
     534 YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                415
                                                                                                                                                           357
                                                                                                                                                                                       355
                                                                                                                                                                                                                                                                       237
                                                                                                                                                                                                                                                                                                                              177
                                                                                                                                                                                                                                                                                                                                                                                   117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    537
                                                                                                                                                                                                                  297
                                                                                                                                                                                                                                                                                                                                                        175
                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                         58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA 533
                                                                                                                    KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK 473
                                                                                                                                                                                                                               GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                    TTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 234
                                                                                                                                                                                                                                                                                                                                                                                  YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                           GTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                        GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                               DTNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                                                                    KMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                                                                                                                                                                                DENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                                                                                         YLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD---DDDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             91.3%;
92.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/09669974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 2740.5;
Pred. No. 6.7e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .5; DB 4;
6.7e-205;
hes 25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                      476
                                                                                                                                                           416
                                                                                                                                                                                     414
                                                                                                                                                                                                                                            354
                                                                                                                                                                                                                                                                                                                                                                                   176
                                                                                                                                                                                                                                                                                                                                                                                                             174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; TYPE: PRT
; ORGANISM: Neisseria
US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ğ
                                                         Š
                                                                                       밁
                                                                                                                 Ş
                                                                                                                                             밁
                                                                                                                                                                       Qγ
                                                                                                                                                                                                    뮍
                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                            뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 13, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: I
SEQ ID NO 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard APPLICANT: MOXON, E. RICHARD APPLICANT: MOXON, E. RICHARD APPLICANT AND APPLICANT AND APPLICANT APPLICATION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILE REFERENCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LENGTH: 598
        590
                                  537
                                                                                         477
                                                                                                                                              417
                                                                                                                                                                        411
                                                                                                                                                                                                    357
                                                                                                                                                                                                                               351
                                                                                                                                                                                                                                                          297
                                                                                                                                                                                                                                                                                      291
                                                                                                                                                                                                                                                                                                                 237
                                                                                                                                                                                                                                                                                                                                            231
                                                                                                                                                                                                                                                                                                                                                                      177
                                                                                                                                                                                                                                                                                                                                                                                                171
                                                                                                                                                                                                                                                                                                                                                                                                                            117
                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11
       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             548;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  <u>ω</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12;
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLEATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASYKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        YLPGKSMMAIGGDTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                                                                                                                                                               GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                            GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGASASVGY
                                                                           VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                             PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                             ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                          GKGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF
                                                                                                                                                                                                                                                                                                                                                                                                            GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD----DDDL
                                                                                                                                                               PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                                                                            ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  90.8%; Score 2725.5; 91.0%; Pred. No. le-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 4/203;
Pred. No. 1e-203;
Pred. no. 1e-203;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                       589
                                                                                                                       529
                                                                                                                                                               476
                                                                                                                                                                                                       469
                                                                                                                                                                                                                                                                                      410
                                                                                                                                                                                                                                                                                                                            356
                                                                                                                                                                                                                                                                                                                                                                  350
                                                                                                                                                                                                                                                                                                                                                                                                            296
                                                                                                                                                                                                                                                                                                                                                                                                                                                   290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                 536
                                                                                                                                                                                                                                              416
```

4;

B

597

Ş.

598

US-09-669-974-13

```
γQ
                                                                                                             밁
                                                                                                                                        ρy
                                                                                                                                                                         밁
                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-669-974-13
                  Š
                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
APPLICANT: PEAK, In Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 055064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 548; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 13
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 13, Application US/09669974 Patent No. 6333173
                   530
                                                                                470
                                                                                                               417
                                                                                                                                             411
                                                                                                                                                                            357
                                                                                                                                                                                                        351
                                                                                                                                                                                                                                         297
                                                                                                                                                                                                                                                                        291
                                                                                                                                                                                                                                                                                                     237
                                                                                                                                                                                                                                                                                                                                    231
                                                                                                                                                                                                                                                                                                                                                                     177
                                                                                                                                                                                                                                                                                                                                                                                                171
                                                                                                                                                                                                                                                                                                                                                                                                                                117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                 VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQALATAG
                                                                                                                           PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                       ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                    TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD---DDDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                       ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                  TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                               NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                               VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                            PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   90.8%; Score 2725.5; DB 4;
91.0%; Pred. No. 1e-203;
Live 12; Mismatches 27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15;
                                                                                                                                         469
                                                                                                                                                                                                                                                                                                                                                                                              230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                            476
                                                                                                                                                                         416
                                                                                                                                                                                                        410
                                                                                                                                                                                                                                                                    350
                                                                                                                                                                                                                                                                                                                                   290
                                                                                                                                                                                                                                                                                                                                                                                                                                                            170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          116
                  589
                                                                              529
                                                                                                                                                                                                                                                                                                                                                                                                                             176
                                               536
                                                                                                                                                                                                                                         356
                                                                                                                                                                                                                                                                                                    296
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                              Qy
                                                                           밁
                                                                                                                           Ъ
                                                                                                                                                  δõ
                                                                                                                                                                                                    Q
                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ₽
Ş
                         В
                                                                                                 Š
                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; ORGANISM: Neisseria meningitidis US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: PEAK, Ian Richard Anselm APPLICANT: MONON, E. RICHARD TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128

CURRENT APPLICATION UNMBER: US/09/377,155

CURRENT FILING DATE: 1999-08-19

PRIOR APPLICATION NUMBER: PCT/AU98/01031

PRIOR PILING DATE: 1998-12-14

PRIOR PILING DATE: 1998-12-14

PRIOR FILING DATE: 1997-12-12

PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQ ID NOS:
SOFTWARE: PatentIn Ve
SEQ ID NO 5
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 5, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 546; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: PRT
 530
                                                  470
                                                                           417
                                                                                                                           357
                                                                                                                                                    351
                                                                                                                                                                                                                                237
                                                                                                                                                                                                                                                                                   177
                                                                                                                                                                                                                                                                                                         171
                                                                                                                                                                                                                                                                                                                                    117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               537
                                                                                                   411
                                                                                                                                                                              297
                                                                                                                                                                                                       291
                                                                                                                                                                                                                                                          231
                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                    YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                                                                                                                                            8-8
 LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY 589
                                      VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                         PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                       ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGASASVGY 596
                          VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                          PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                           ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                    YLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ON: NOVEL SURFACE ANTIGEN
065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  90.5%; Score 2716.5; DB 90.7%; Pred. No. 5e-203;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                           476
                                                                                                                           416
                                                                                                                                                    410
                                                                                                                                                                                                       350
                                                                                                                                                                                                                                                                                                                                                                                    116
                                                                                                                                                                                                                                                                                                                                                                                                                                       57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                               356
                                                                                                                                                                                                                                296
                                                                                                                                                                                                                                                          290
                                                                                                                                                                                                                                                                                   236
                                                                                                                                                                                                                                                                                                         230
```

4

4.

```
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR PLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIA VET. 2.0
SEQ ID NO 5
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 14
US-09-669-974-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                              QΥ
                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                    ρy
                                                                           뫄
                                                                                                                   Ф
                                                                                                                                                             В
                                                                                                                                                                              Qy
                                                                                                                                                                                                      В
                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                    밁
* 5
                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 5, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE: PRT ORGANISM: Neisseria meningitidis 09-669-974-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. RICHAEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: PEAK, APPLICANT: JENNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    537
                                                                                                 351
                                                                                                                     297
 470 VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                          291
                                                                                                                                                                                                        177
                                                                                                                                                                                                                             171
                                                                                                                                                                                                                                                 117
                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                                                                                                          1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QW 591
                                ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                             TNGDTTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP 230
                                                                                                                                                                                                                                                           -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                          YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                                                                                     GKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF
                                                                                                                                 GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                    ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                         90.5%; Score 2716.5; DB 90.7%; Pred. No. 5e-203;
                                                                                                                                                                                                                                                                                                                                                                                13;
                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                   DB 4;
                                                                                                                                                                                                                                                                                                                                                                                 28;
                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                      598;
                                                                                                                                                                                                                                                                                                                                                                                 15;
                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                             116
                                                                                                  410
                                                         469
                                                                                                                                           350
                                                                                                                                                                                                                                                     176
                                                                                                                                                                                                                                                                       170
                                                                                                                                                                                                                                                                                                                                        57
                                                                              416
                                                                                                                                                                296
                                                                                                                                                                                     290
                                                                                                                                                                                                                                                                                                                                                                                 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                             В
                                             Q
                                                                    밁
                                                                                       Š
                                                                                                              g
                                                                                                                               Qy
                                                                                                                                                      밁
                                                                                                                                                                         Qy
                                                                                                                                                                                                В
                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         537
                                                                                          351
                                                                                                                                                       238
                                                                                                                                                                                                                                           118
                                                                                                                                                                                                                                                                121
       470
                                                                     358
                                                                                                              298
                                                                                                                                   291
```

```
RESULT 15
US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; ORGANISM: Neisseria meningitidis US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: P
SEQ ID NO 15
LENGTH: 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 15, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches 538;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 89.4%;
Best Local Similarity 89.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGE
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     477
                                                                                                                                                                                                                                                       61 YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            W<sub>Q</sub>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                               GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                         GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                      -LEPVVRSALVLQFMIDKEGNGENEST-GNIGWSIXYDNHNTLHGATVTLKAGDNLKIKQ 117
VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; Score 2685; DB 4;
; Pred. No. 1.4e-200;
16; Mismatches 34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              589
                                                                                        417
                                                                                                                   410
                                                                                                                                                                           350
                                                                                                                                                                                                                                 290
                                                                                                                                                                                                                                                              237
                                                                                                                                                                                                                                                                                                                     177
                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                               357
                                                                                                                                                                                                      297
```

4.

Searc Job t	Db	Qy	Db	Qy	Db
h com ime:	598	590	538	530	478
Search completed: July 3, 2002, 08:10:12 Job time: 524 sec	598 QW 599	590 QW 591	538 LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY 597	530 LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY	
c Jul			PGKSI	.PGKSI	NKPV
·γ			MAI	MAI	RITN
ω			GGG	ဌဌဌ	VAP
2002,			TYRGEA	TYRGEA	GVKEGE
08:			GYA	GYA	YTY 
10:1			IGYS	IGY	VAQI
2			SIS	SIS	KGV
			DGGN	DGGN	AQNI
			MII	MII	NNR
			KGTA	KGTA	EDNA III
			SGNS	SGNS	DGN/
			RGH	SRGH	\RAG
			FGAS	FGAS	IAQA
			ASVGY	ASVGY	INTAG
			597	589	537

THIS PAGE BLANK (USPTO)

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    on:
              110
110
110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
     2984
2977
2971.5
2978.5
2758.5
2758.5
2758.5
2740.5
                                                                                                                                                                                                                                                                                                                                         Score
                                                                                                                                                                                                                            3003
3003
3003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A_Geneseq_032802:*

1: /SIDS1/gcgdata/hc
2: /SIDS1/gcgdata/h
3: /SIDS1/gcgdata/h
4: /SIDS1/gcgdata/h
6: /SIDS1/gcgdata/h
7: /SIDS1/gcgdata/h
6: /SIDS1/gcgdata/h
7: /SIDS1/gcgdata/h
10: /SIDS1/gcgdata/h
9: /SIDS1/gcgdata/
11: /SIDS1/gcgdata/
11: /SIDS1/gcgdata/
11: /SIDS1/gcgdata,
11: /SIDS1/gcgdata,
11: /SIDS1/gcgdata,
12: /SIDS1/gcgdata,
13: /SIDS1/gcgdata
14: /SIDS1/gcgdata
15: /SIDS1/gcgdata
16: /SIDS1/gcgdata
17: /SIDS1/gcgdata
18: /SIDS1/gcgdata
19: /SIDS1/gcgdata
19: /SIDS1/gcgdata
19: /SIDS1/gcgdata
19: /SIDS1/gcgdata
19: /SIDS1/gcgdata
20: /SIDS1/gcgdata
21: /SIDS1/gcgdata
22: /SIDS1/gcgdata
22: /SIDS1/gcgdata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                length:
        100.0
100.0
100.0
99.4
99.1
99.1
99.0
91.9
91.9
91.9
                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-771-382-1
3003
1 MNKIYRIIWNSALN
                                                                                                                                                                                                                                                                                                                                                                  Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1980.Di
2: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1981.Di
3: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1982.DA
4: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1982.DA
5: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1983.DA
5: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1984.DA
6: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1985.DA
7: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DA
8: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DA
9: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1989.DA
9: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DA
10: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DA
11: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DA
12: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1992.DA
13: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1993.DA
14: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DA
15: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DA
16: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DA
17: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DA
18: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DA
19: /SIDSI/gcgdata/hold-geneseq/geneseqp-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  July 3, 2002, 08:00:54; Search time 168.6 Seconds (without alignments) 389.351 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     747574 seqs, 111073796 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MNKIYRIIWNSALNAWVVVS.....TASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2000000000
        591
591
591
591
592
594
594
                                                                                                                                                                                                                                                                                                                                      DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gapext 0.5
        222222222
                                                                                                                                                                                                                                                                                                                                      Ħ
  AAY23740
AAY57044
AAU06174
AAY23739
                                                                                                            AAY27202
AAY23746
AAU06171
AAY23741
AAY23741
AAU06175
AAY57045
AAY23737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    747574
                         A surface protein
A surface protein
BASB029 amino acid
N. meningitidis EG
                                                                                                                                   Amino acid sequenc
A surface protein
N. meningitidis PM
A surface protein
N. meningitidis EG
BASB029 amino acid
                                                                                                                                                                                                                                                                                                                                   Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5 earch
  A CREAKE RESERVE AND CREAKE RESE
                                                                                                                                                                                                                                                                          09-OCT-1998;
14-JAN-1998;
01-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             New protein and its nucleotide sequence, useful in vaccines or diagnostic compositions for treating and/or preventing Neisseria {\sf New}
                                                                                  WPI; 1999-444400/37.
N-PSDB; AAX99124.
                                                                                                                                                                Grandi G, Masignani
                                                                                                                                                                                                                                                                                                                                                                                         14-JAN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   W09936544-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             bacterial infection; treatment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis protein; pharmaceutical; vaccine; diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Amino acid sequence of N. meningitidis protein ORF40-1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-SEP-1999 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY27202 standard; Protein;
                                                                                                                                                                                                                         (CHIR-) CHIRON SPA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                22-JUL-1999.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY27202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2773.5
2775.5
2775.5
27716.5
27716.5
27716.5
27716.5
2773.5
2573.5
2573.5
2573.5
2479
2464.5
2435.5
2435.5
2436.5
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
210.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       990.88

900.88

900.88

900.88

900.88

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74

805.74
                                                                                                                                                                                                                                                                          98GB-0022143.
98GB-0000760.
98GB-0019015.
                                                                                                                                                                                                                                                                                                                                                                                         99WO-IB00103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <
                                                                                                                                                                   Pizza
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          591 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAB69136
ABB52677
AAB69135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAB23855
AAB23857
AAB23854
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAU06186
AAU06186
AAU27203
AAU06188
AAU27203
AAU06181
AAU06181
AAU06184
AAU26184
AAU29393
AAU393933
AAU3939393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAU06182
AAY23745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAU06179
AAY23742
AAU06177
AAY23787
AAU061778
AAU06176
AAY23743
AAU06176
AAY23744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAB23859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAB37832
                                                                                                                                                                   ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ALIGNMENTS
                                                                                                                                                                   Rappuoli R,
                                                                                                                                                                   Scarlato
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N. meningitidis BZ
A surface protein
N. meningitidis H1
A surface protein
N. meningitidis H3
A surface protein
N. meningitidis H3
A surface protein
N. meningitidis PA
Haemophilus influe
Haemophilus adhesi
Haemophilus influe
```

```
SXCCCCCXXXXX
                                                                                                                                                                                           20
                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                  δô
                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                        Б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The invention provides proteins (AAX277201-245) from Neisseria meningitidis (strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g. a vaccine composition or a diagnostic composition. The composition is also useful for treating or preventing an infection due to Neisserial bacteria, especially Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis infections
                                                                                                               AAY23746 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
           immunoreactive peptide.
                      Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                        541
                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                           surface protein of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                              591;
                                                                                                                                                                     MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                               ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM 540
                                                                                                                                                                                                                                                               ninagnnieitrngknidiatsmtpqfssvslgagadaptlsvdgdalnvgskkdnkpvr
                                                                                                                                                                                                                                                                                      NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                         {\tt skddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmdetv}
                                                                                                                                                                                                                                                                                                                     SKDDQGNITWMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                   VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ngtnftyslkkdltdltsvgteklsfsangnkvnitsdtkglnfaketagtngdttvhln
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                  itnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqaylpgksm
                                                                                                                                                                                                                                                                         Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62;
                                                                                                                Protein;
                                                                  entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      English
                                                                                                                591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 3003; DB 20;
Pred. No. 2.1e-171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                         591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                      480
                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
```

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      дЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                         Qy
                                                                                             망
                                                                                                                                            Qy
                                                                                                                                                                                                망
                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Ma
Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria meningitidis : meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 1; Page 127-128; 132pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (ISIS-) ISIS
(UYQU ) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24-JUN-1999
421
                                                 421
                                                                                                  361
                                                                                                                                                    361
                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ب
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV
                                                                                                                                                                                                                                                                                                                             VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1999-418754/35
                       NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                             skddqgnitv mydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmdetv\\
                                                                                                                       SKDDQGNITWMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                tdegeglv take \verb|vidav| nkag wr mktt tang qtg qadk fet vtsg tn vtf as gkgt tat vtsg to the sum of 
                                                                                                                                                                                                                                                                                                     vrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgklvtgkdkgengss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591;
ninagnnieitrngknidiatsmtpqfssvslgagadaptlsvdgdalnvgskkdnkpvr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAX85798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INNOVATION LTD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98WO-AU01031.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         surface proteins useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Peak IRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 3003; DB 20; Pred. No. 2.1e-171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
```

0,

481

ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM

540

480

480

420

360 360 300 300 240

240

밁

treating

얶

```
RESULT
AAU06171
ID AAU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAU06171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAU06171
New NhhA surface antigen polypeptides and polynucleotides
                          WPI; 2001-488774/53.
N-PSDB; AAS09161.
                                                                                                                       25-JAN-2000;
                                                                                                                                                  25-JAN-2001;
                                                                                                                                                                             02-AUG-2001.
                                                                                                                                                                                                        WO200155182-A1
                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria
                                                                                             (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       maigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meningitidis strain PMC21
                                                                                                                       2000US-0177917
                                                                                                                                                  2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                         /note= "\
237..591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NhhA;
                                                                                                                                                                                                                                                                                    230..236
/label= v4
                                                                                                                                                                                                                                                                                                                                        /label= V3
/note= "Variable region 211..229
                                                                                                                                                                                                                                                                                                                                                                                 /note= "Conserved 189..210
                                                                                                                                                                                                                                 /label=
/note= '
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= C1
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                             /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          109..120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                               /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               note= "Conserved"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= Mature_NhhA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'label= Signal_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . 124
                                                                                                                                                                                                                                                                                                                                                                                                                          .188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningococcal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Predicted mature protein, specifically claimed in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Variable region 1"
                                                                                                                                                                                                                                                                    "Variable region
                                                                                                                                                                                                                              "Conserved region
                                                                                                                                                                                                                                               CS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    591
                                                                                                                                                                                                                                                                                                                                                                                             region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       disease; meningitis
                                                                                                                                                                                                                                                                                                                                                                                                                                         ພູ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            540
                          AAY23741
ID AAY
                                                                                                                                                 덩
                                                                                                                                                                         Ş
                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                         Ър
                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                   рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AC X
                                                     RESULT
                                                                                             В
                                                                                                                  δõ
                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antiqen Nhha (AAU06182-AAU06186). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding the wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain pMC21 is 1 of 10 Nhha polypeptide sequences (AAU06181) from 10 different N. meningitidis strains given in
 AAY23741;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                          AAY23741 standard; Protein; 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence
                                                                                             541
                                                                                                                    541
                                                                                                                                                 481
                                                                                                                                                                          481
                                                                                                                                                                                                     421
                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   present invention.
                                                                                                        MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                  NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR 480
                                                                                                                                                                                                                                                     VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                               itnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqaylpgksm
                                                                                                                                                            ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                   ninagnnieitrngknidiatsmtpqfssvslgagadaptlsvdgdalnvgskkdnkpvr
                                                                                                                                                                                                                                                                                                            \verb|tdegeglvta| kevidavn kagwrmktttangqtgqadk fetvtsgtnvtfasgkgttatv|
                                                                                                                                                                                                                                                                                                                        TDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV
                                                                                                                                                                                                                                                                                                                                                                 vrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgklvtgkdkgengss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Fig 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 3003; DB 22;
Pred. No. 2.1e-171;
                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
```

591

540 540 480 420 420 360 360 300

240 240

300

591

Indels Length

Gaps

0

60

120 120 60

591; 0

```
δÃ
                                                                                                                               Qy
                                                                                                                                                      В
                                                                                                                                                                         δÕ
                                                                                                                                                                                                B
                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                            밁
                                                                 В
                                                                                                           밁
                                                                                                                                                                                                                                                               δÃ
Ş
                     밁
                                       δÃ
                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 588; Conserv
                                                                                                                                                                                                                                                                                                                                                               The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VIND ( UQYU) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      immunoreactive
                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim 1; Page 104-106; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis surface proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12-DEC-1997;
                                                                 241
                                                                                                                                 181
  361
                                            301
                                                                                                            181
                                                                                                                                                                             121
                      301
                                                                                                                                                       121
                                                                                                                                                                                                   61
                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                           \verb|gigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgttasdnvdf|
                                                                                                                      GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDE
                                                                                                                                                                 NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                             YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1999-418754/35.
                                                                                                                                                                                                 yldpvlrtvavlivnsdkegtgekekveensdwavyfnekgvltareitlkagdnlkikg
SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                       \tt ngtnftyslkkdltdltsvgteklsfsangnkvnitsdtkglnfaketagtngdttvhln
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein
                                                                                                                                                                                                                                                                                                                                               591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                  99.4%;
99.5%;
                                                                                                                                                                                                                                                                                       Score 2984; D. Pred. No. 2.9e 1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                       DB 20;
2.9e-170;
nes 2;
                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                1 591;
                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                              180
                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                     60
                                                                    300
                                                                                         300
                                                                                                                                  240
                                                                                                                                                         180
                                                                                                              240
                                                                                                                                                                                                                                                                                           0
```

02-AUG-2001.

Peak IRA,

Jennings MP

2001-488774/53 DB; AAS09165.

(UYQU ) UNIV QUEENSLAND

25-JAN-2000; 25-JAN-2001;

2000US-0177917 2001WO-AU00069

```
RESULT AAUUGATA AAUUG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N. meningitidis EG329 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAU06175;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAU06175 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     υı
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ninagnnieitrngknidiatsmtpqfssvslgagadaptlsvdgdalnvgskkdnkpvr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             \verb|itnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqaylpgksm|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first
                                                                                                                                                                                                                                                                                                                                                /note= "1237..591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                              230.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       211..229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= V3
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 189..210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           125..188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label= V2
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= C2
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Variable
109..120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label= C1
                                                                                                                                                                                                                                                                                                                             /label=
                                                                                                                                                                                                                                                                                                                                                                                       /label=
                                                                                                                                                                                                                                                                                                                                                                                                                             /label= C4
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      'label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entry)
                                                                                                                                                                                                                                                                                                                                                                                                            . . 236
                                                                                                                                                                                                                                                                                                                                                                "Variable
                                                                                                                                                                                                                                                                                                          "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                         ٧4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C2
                                                                                                                                                                                                                                                                                                                             C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EG329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                420
```

AAY57045;

```
δÃ
                                                                          Qy
                                                                                                       밁
                                                                                                                             δÃ
                                                                                                                                                           В
                                                                                                                                                                                 20
                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                               Ър
                                                                                                                                                                                                                                                                                       20
                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                    рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain EG329 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim
                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                         121
                          541
                                                     481
                                                                              481
                                                                                                        421
                                                                                                                                  421
                                                                                                                                                           361
                                                                                                                                                                                     361
                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           present invention.
                                                                                                                                                                                                                                                                                                                                                                     GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
             MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                    yldpvlrtvavlivnsdkegtgekekveensdwavyfnekgvltareitlkagdnlkikg 120
                                                                                                                                                                                                                                                                                                                                                                                                                                       YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
maigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                  gigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgttasdnvdf
                                                  itnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqaylpgksm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2984; DB 22;
Pred. No. 2.9e-170;
1; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                               480
                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                        300
                                                    540
                                                                                                       480
                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
```

```
This is the Nisseria meningitidis BASB029 amino acid sequence from CC serogroup B strain H44/76. The BASB029 protein is homologous to the CC Haemophilus influenzae surface fibril (HSF) protein. The invention CC relates to BASB029 polynuclectide sequences (AAX39864-Z39865) and CC BASB029 polypeptides sere useful in a method of diagnosing a Neisseria CC meningitidis infection in a mammal. Compositions containing BASB029 colynucleotides and polypeptides are useful for generating an immune CC response in an animal. A therapeutic composition comprising an antibody CC directed against BASB029 is useful in treating humans with Neisseria CC meningitidis disease. The polynucleotide is useful in the diagnosis of CC infection which results from increased or decreased expression of the CC polynucleotide, and for therapeutic or prophylactic purposes, CC particularly genetic immunisation. Antibodies against BASB029 co polynucleotides and polypeptides are also useful in the compositions of the CC particularly bacterial infections. The protein is useful in the CC particularly sensor of an organism of the immune system of an organism protein is useful for the stimulation of the immune system of an organism protein is useful for the stimulation of the immune system of an organism protein is useful for the stimulation of the immune system of an organism
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note=
Misc-difference 269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note=
Misc-difference 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BASB029; Nisseria meningitidis; surface fibril protein; HSF; diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Claim 4; Fig 2; 74pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ruelle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BASB029 amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (SMIK ) SMITHKLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2000-053103/04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                treatment; prevent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note=
123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Encoded by AATC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Encoded by AAT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    from N. meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   antibacterial drug
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAC *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACA"
                             immune system of an organism
```

591;

RESULT AAY57045 ID AAYS

σ

AAY57045 standard; Protein;

591

Ą

99.0%;

```
2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local Similarity 99.0 Matches 585; Conservative
                                                                   (ISIS-)
                                    Jennings MP,
                                                                                                                          12-DEC-1997;
                                                                                                                                                           14-DEC-1998;
                                                                                                                                                                                                24-JUN-1999
                                                                                                                                                                                                                                                                                                      Surface protein; immunoreactive p
                                                                                                                                                                                                                                                                                                                                                                                              08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAY23737 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                          surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        skddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmdetv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  y ldpvqrtvav livns dkegt gekek veeds n wavyf dek gvltare it lkagdnlkik quadrum to be a substitution of the substitution of t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                       VIND
                                                                                                                                                                                                                                                                  meningitidis.
                                                                                                                                                                                                                                                                                                                                                          protein of Neisseria
                                                                       INNOVATION
QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                    Moxon
                                                                                                                          97GB-0026398
                                                                                                                                                           98WO-AU01031
                                                                                                                                                                                                                                                                                                                       surface glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Protein;
                                      ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pred. No. 7.6e-170; 5; Mismatches 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    592
                                                                                                                                                                                                                                                                                                                                                        meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
```

RESULT
AAY23740
ID AAY2
XX
AC AAY2
XX
DT 08-S
XX

AAY23740; AAY23740

Protein;

594

A

08-SEP-1999

(first

entry)

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                          밁
                                                            Ωy
                                                                                   Вb
                                                                                                    δÃ
                                                                                                                          뫄
                                                                                                                                            Ş
                                                                                                                                                                  В
                                                                                                                                                                                      Qy
                                                                                                                                                                                                           밁
                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                             Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
 541
                     540
                                          481
                                                              480
                                                                                   421
                                                                                                       420
                                                                                                                            361
                                                                                                                                               360
                                                                                                                                                                   301
                                                                                                                                                                                        300
                                                                                                                                                                                                           241
                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                           Match
                                                                                                                                                                                                                                                                                          MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                         VSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET
                                                                                                                                                                                                                                                 ritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqaylpgks
                                                   RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKS
                                                                                            VNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPV
                                                                                                                                                                             STDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTEASGKGTTAT
                                                                                                                                                                                                          mmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                   vninagnnieitrngknidiatsmtpqfssvslgagadaptlsvdgdalnvgskkdnkpv
                                                                                                                                                                  \verb|stdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkgttat|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1; Page 86-87; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAX85788
                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        592 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                             99.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2971.5;
Pred. No. 1.6e
3; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              proteins
                                                                                                                                                                                                                                                                                                                                                                                                                               5; DB 2:
.6e-169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               useful
                                                                                                                                                                                                                                                                                                                                                                                                                                         20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             treating
                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                      591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     numans
                                                                                                                                                                                                                                                                                                                                                                                                                     ۲
                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                              539
                                                                                   480
                                                                                                       479
                                                                                                                             420
                                                                                                                                                 419
                                                                                                                                                                     360
                                                                                                                                                                                         359
                                                                                                                                                                                                              300
                                                                                                                                                                                                                                 299
                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                  59
```

1;

surface

protein of Neisseria meningitidis.

```
Query Match
Best Local s
Matches 552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to the form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     UQYU)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        immunoreactive
                                                                                                                                                                                235
                                                                                                                                                                                                                     177
                                                                                                                                                                                                                                                         175
                                                                                                                                                                                                                                                                                            117
                                                                                                                                                                                                                                                                                                                              121
   357
                                     355
                                                                         297
                                                                                                            295
                                                                                                                                                237
                                                                                                                                                                                                                                                                                                                                                                58
                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity 92.
                                                                                                                                                                                                                                                                                                                                                                                                                                     _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Н
                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1999-418754/35
                GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                               YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYENEKGVLTAREITLKAGDNLKIKQ 120
gttatvskddggnitvmydvnvgdalnvnglqnsgwnldskavagssgkvisgnvspskg
                                                                                        GENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                            sdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkdk
                                                                                                                                                               SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                 {\tt ttvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtta}
                                                                                                                                                                                                                                  TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                            ylepvqrtavvlsfrsdkegtgeke-vtedsnwgvyfdkkgvltagtitlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VIND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ĄP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   identify
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INNOVATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     100-101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            91.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LTD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2758.5; DB 2
Pred. No. 8.4e-157;
4; Mismatches 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 20; Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                 414
                                                                                                        354
                                                                                                                                                                                294
                                                                                                                                                                                                                                                     234
                                                                                                                                                                                                                                                                                         176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                       356
                                                                                                                                            296
                                                                                                                                                                                                                   236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4
```

Š

밁 οy 망 Qy В οy 밁 Ş Вb δÃ 밁

밁

```
RESULT
AAY57044
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                     This is the Nisseria meningitidis BASB029 amino acid sequence from CC serogroup B strain ATCC13090. The BASB029 protein is homologous to the CC Haemophilus influenzae surface fibril (HSF) protein. The invention CC relates to BASB029 polynucleotide sequences (AAX39864-Z3965) and CC polypeptide sequences (AAY57044-Y57045) and their immunogenic fragments. CC BASB029 polypeptides are useful in a method of diagnosing a Neisseria CC meningitidis infection in a mammal. Compositions containing BASB029 CC polynucleotides and polypeptides are useful for generating an immune CC response in an animal. A therapeutic composition comprising an antibody CC directed against BASB029 is useful in treating humans with Neisseria CC meningitidis disease. The polynucleotide is useful in the diagnosis of CC the stage of infection, type of infection, susceptibility to an CC infection which results from increased or decreased expression of the CC polynucleotide, and for therapeutic or prophylactic purposes, CC particularly genetic immunisation. Antibodies against BASB029 CC particularly bacterial infections. The protein is useful in the CC creation and development of antibacterial drugs. Fused recombinant CC particularly section the stimulation of the immune system of an organism of the immune system of an organism creation.
                                                                                                                                                                                                                                                                                                                                                 Claim 4;
                                                                                                                                                                                                                                                                                                                                                                                                                              N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Misc-difference
                                                                                                                                                                                                                                                                                                                                                                              New polypeptide from neisseria meningitidis useful treatment or prevention of bacterial infections in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ruelle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BASB029; Nisseria meningitidis; surface fibril protein; HSF; diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASB029 amino acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAY57044;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY57044 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 2000-053103/04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (SMIK ) SMITHKLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK 473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dankpvritnvapgvkegdvtnvaqlkgvaqnlnnhidnvdgnaragiaqaiataglvqa 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA 533
                                                                                                                                                                                                                                                                                                                                                Fig 2; 74pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    treatment; prevent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Encoded by AATC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  from N. meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      antibacterial drug
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ⋛
                             immune system of an organism
                                                                                                                                                                                                                                                                                                                                                                                 for diagnosis, mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATCC13090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             591
```

```
RRESULT 1
AAUO6174
ID AAUG
XX AAUG
AC AAUG
XX AAUG
XX Suri
XX Suri
XX Suri
XX Neis
XX Neis
XX Neis
FT Reg
FT Reg
FT Reg
FT Reg
FT Reg
                                                                                                                                                                                                                                                                                                                                                                                                                      SQ
                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                             Db
                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                  δõ
                                                                                                                                                                               Вb
                                                                                                                                                                                        ρ
                                                                                                                                                                                                      밁
                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                   Ър
                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                   Region
                                                   Region
                                                                     Neisseria
                                                                                           N. meningitidis
                                                                                                      24-OCT-2001
                                                                                                                            AAU06174 standard;
Region
                  Region
                                                                                                                                                                                                                                                                                                177
                                                                                                                                                                                                                                                                                                                       117
                                                                                                                                                                                                                                                                                                            175
                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                         537
                                                                                                                                                                                477
                                                                                                                                                                                                      417
                                                                                                                                                                                                                            357
                                                                                                                                                                                                                                       355
                                                                                                                                                                                                                                                   297
                                                                                                                                                                                                                                                              295
                                                                                                                                                                                                                                                                          237
                                                                                                                                                                                                                                                                                     235
                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                             58
                                                                                                                                                                                                                                                                                                                                                        \mathbf{1}
                                                                                                                                                                                                                                                                                                                                            mnkiyriiwnsalnawvavseltrnhtkrasatvatavlatllfatvqasttd---dddl
                                                                                                                                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                                                                                                                                                              gttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskg
                                                                                                                                                                                                                                 GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                   gendsstdkgeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgk
                                                                                                                                                                                                                                                        GENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                      KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK 473
                                                                               antigen
                                                                    meningitidis strain EG327.
                                                                                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                      (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                       ₽
                                                                                           EG327 surface antigen NhhA polypeptide sequence
                                   /note= "Conserved 51..104
                                                                               NhhA;
 /note-
117..1;
                                              /label= C1
                                                         Location/Qualifiers
                      /label= V1
/note= "Variable
            'label= C2
                  .05..116
                                                                                                                             Protein;
                                                                                                                                                                                                                                                                                                                                                                                                91.9%;
92.3%;
                                                                               meningococcal
      "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                          14;
                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                             B
                        region
                                                                                                                                                                                                                                                                                                                                                                                               NO. 8.4e
                                         region
                                                                                disease;
                                                                                                                                                                                                                                                                                                                                                                                                .4e-157;
                                                                                                                                                                                                                                                                                                                                                                                                      DB
                                                                                                                                                                                                                                                                                                                                                                                                      21;
                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                           11;
                                                                                                                                                                                                                                                                                                                                                                                                      594;
                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                              354
                                                                                                                                                                                                                                                                                     294
                                                                                                                                                                                                                                                                                                                       176
                                                                                                                                                                                                                                                                                                                                   174
                                                                                                                                                                                                                                                                                                                                                                    57
                                                                                                                                                                                                                                                                                                            234
                                                                                                                                                                                                       476
                                                                                                                                                                                                                             416
                                                                                                                                                                                                                                        414
                                                                                                                                                                                                                                                    356
                                                                                                                                                                                                                                                                          296
                                                                                                                                                                                                                                                                                                236
                                                                                                                                                                                                                                                                                                                                                                                           4;
                                                                                                                                        •
                                                                                                       1 T T
                                                                                                                                                                                                                                                                                                                                                                                                      17 T T T T
                                        Q
        밁
                  Š
                              밁
                                                    DЬ
                                                               δõ
```

```
Matches
                                                                                                                                                                                                                                                                          Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                             The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain EG327 is 1 of 10 NhhA polypeptide sequences (AAU06180) from 10 different N. meningitidis strains given in the present invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (UYQU ) UNIV QUEENSLAND
                                           121
                                                                                                                          61
                                                                                58
                                                                                                                                                                                     1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                present invention.
                                                                            2001-488774/53
-----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD 174
                                                                                                                                                                   mnkiyriiwnsalnawvavseltrnhtkrasatvatavlatllfatvqasttd---dddl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAS09164
                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           broad spectrum of Neisseria
                                                                                                                                                                                                                                                                                                                                                           594
                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                             ΑA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= V3
/note= "Variable
213..231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "Variable
239..594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "Conserved 232..238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Conserved 191..212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= V2
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label= V4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 127..190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label=
                                                                                                                                                                                                                                                                        91.9%;
92.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C4
                                                                                                                                                                                                                                                      14;
                                                                                                                                                                                                                                                                          Score 2758.5;
Pred., No. 8.46
                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2
                                                                                                                                                                                                                                                                          5; DB 22;
3.4e-157;
                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                              Length 594;
                                                                                                                                                                                                                                                           11;
```

or C

117

Gaps

57 60

11; 594;

Gaps

4.

176

174

234

236

120

57

60

```
RESULT 1
AAY23739
The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also
                                                                                                            Claim 1;
                                                                                                                                 Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                      N-PSDB;
                                                                                                                                                                                                         Jennings
                                                                                                                                                                                                                                                                   12-DEC-1997;
                                                                                                                                                                                                                                                                                          14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAY23739 standard;
                                                                                                                                                                                                                              (ISIS-) ISIS
                                                                                                                                                                                                                                                                                                                                         WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                  08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY23739;
                                                                                                                                                                                                                                                                                                                                                                                      Surface protein; surface mmunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          175
                                                                                                                                                                                                                                                                                                                                                                                                                          surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1999-418754/35
DB; AAX85791.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dankpvritnvapgvkegdvtnvaqlkgvaqnlnnhidnvdgnaragiaqaiataglvqa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSDSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gendsstdkgeglvtakevidavnkagwrmktttanggtggadkfetvtsgtnvtfasgk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ttvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkdk
                                                                                                                                                                                                         ΜP,
                                                                                                          Page 95-97; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                         protein of Neisseria
                                                                                                                                                                                                                               INNOVATION
QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                        Moxon
                                                                                                                                                                                                                                                                  97GB-0026398
                                                                                                                                                                                                                                                                                          98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Protein;
                                                                                                                                                                                                         ER,
                                                                                                                                                                                                                                            CILD
                                                                                                                                                                                                                                                                                                                                                                                                 glycoprotein;
                                                                                                                                                                                                         Peak
                                                                                                            English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594
                                                                                                                                                                                                         IRA;
                                                                                                                                             proteins
                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A
                                                                                                                                                                                                                                                                                                                                                                                                 infection; vaccine;
                                                                                                                                               useful for
                                                                                                                                             treating
                                    humans
                                                                                                                                             z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          354
 RESULT 12
AAU06179
ID AAU0617
XX AU0611
XX AU0611
XX AU0611
XX AU061
XX AU061
XX Surfac
XX Surfac
XX Surfac
XX Regior
FT Regior
FT Regior
FT Regior
                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ₽
                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Soxco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 551
                                                                                  Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        be
             Region
                                                                                                                       Neisseria
                                                                                                                                                                                             24-OCT-2001
                                                                                                                                                                                                                    AAU06179;
                                                                                                                                                                                                                                           AAU06179 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                               Region
                                                                                                                                                                                                                                                                                                     537
                                                                                                                                                                                                                                                                                                                           534
                                                                                                                                                                                                                                                                                                                                                    477
                                                                                                                                                                                                                                                                                                                                                                          474
                                                                                                                                                                                                                                                                                                                                                                                                 417
                                                                                                                                                                                                                                                                                                                                                                                                                         415
                                                                                                                                                                                                                                                                                                                                                                                                                                                357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                    meningitidis BZ198
                                                                                                                                                                                                                                                                                                 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                              KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ntnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketagtngd
                                                                                                                                                                                                                                                                                                                                                  dtnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqa
                                                                                                                                                                                                                                                                                                                                                                                                                                              gttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskg
                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mnkiyriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd---dddl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      551;
                                                                                                                                             antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ç
                                                                                                                       meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       identify
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                          (first entry)
                                  /note= "Coi
51..104
/label= V1
                                                                                                                                             NhhA;
            /note= "Variable region 105..116
                                                                      /label=
                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                           Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       immunoreactive peptides
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              91.3%; 92.1%;
                                                                                                                                             meningococcal disease;
                                                                                                                                                                    surface
                                                            "Conserved
                                                                                                                       strain
                                                                          Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11;
                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score
Pred.
                                                                                                                       BZ198
                                                                                                                                                                    antigen NhhA polypeptide
                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  No. 1e-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1e-155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
```

416

414

356 354 296 294

Qy

밁

Qy В Ω

В

δÃ В Š 밁 δÃ 밁 Š

밁

sequence

Qy

밁

Вþ

QΥ

Qy 뫄 20

밁

```
meningitidis mutant polypeptides of the surface antigen NhhA CC (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are CC (the deletion of variable regions. The deletion mutants are useful in CC diagnostics, therapeutic and prophylactic vaccines against a broader CC spectrum of N. meningitidis, and in designing and/or screening of CC medicaments. The mutant proteins when used as a vaccine can effectively cimmunise against a broader spectrum of N. meningitidis strains than CC would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA CC (AAU06171-AAU06180) from 10 different N. meningitidis strains circum contents invention.
                                                                                                                                                                           δõ
                                망
                                                  ρy
                                                                         В
                                                                                              δÃ
                                                                                                                                Query
Best L
                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                    Claim 9;
                                                                                                                                                                                                                                                                                                                                                                                       New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          02-AUG-2001.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Regior
                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-JAN-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
            121
                                58
                                                    61
                                                                                                                                 Local
                                                                                                                                            Match
                                                                                     MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                         YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYENEKGVLTAREITLKAGDNLKIKQ 120
                                                                                                                                                                                                                                                                                                                                                                                                                                              2001-488774/53.
                                                                          mnkiyriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd---dddl
                               Similarity
                                                                                                                                                                                                                                                                                                                                                                  Fig 1; 91pp;
                                                                                                                     91.3%;
nilarity 92.1%;
Conservative 1
                                                                                                                                                                            594
          NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2001WO-AU00069
ΑA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= V4
/note= "Variable |
239..594
/label= C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "(
117..126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note= "Conserved 232..238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= V3
/note= "Variable
213..231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note= "Conserved
191..212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= V2
/note= "Variable
127..190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label=
                                                                                                                                                                                                                                                                                                                                                                   English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Conserved
                                                                                                                     b; Score 2740.5;
b; Pred. No. 1e-1
11; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                 ປ.5,
. 1e-155;
. 25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2
                                                                                                                                            DΒ
                                                                                                                                           22;
                                                                                                                      Indels
                                                                                                                                        Length
                                                                                                                                            594;
                                                                                                                      11;
                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                    Or.
            174
                                116
                                                                           57
                                                                                                                      4;
```

humans. to

```
RESULT
AAY23742
The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to
                                                                                                                                     meningitidis
                                                                                                                                                                                                    WPI;
                                                                                                                                                                                                                                                           (ISIS-)
                                                                                                                                                                                                                                                                                                                                                                   24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                   WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAY23742;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY23742
                                                                                                                                                       Neisseria
                                                                                                                                                                                     N-PSDB;
                                                                                                                                                                                                                               Jennings
                                                                                                                                                                                                                                                                                                         12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                       14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
|||||||||||||||||
gttatvskddggnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvlsgnvspskg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1999-418754/35
DB; AAX85794.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    dtnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \verb|ntnentndssftyslkkd|| tdltsveteklsfgangnkvnitsdtkg|| nfaketagtngd||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                kmdetvninagnnieitrngknidiatsmapqfssvslgagadaptlsvddegalnvgsk
                                                                                                                                                                                                                                                             UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein;
                                                                                                                                                                                                                               ΜP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   standard;
                                                                                                         Page
                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                               meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                           QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                               Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                               peptide
                                                                                                                                                                                                                                                                                                                                       98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Protein;
                                                                                                                                                       surface
                                                                                                           132pp;
                                                                                                                                                                                                                                                                             LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                 Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   598
                                                                                                           English.
                                                                                                                                                       proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                       useful
                                                                                                                                                        for
                                                                                                                                                        treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               236
```

Q 밁 Qy 밁 Q 망

```
δÃ
                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                      δõ
                                                                                                                                                 д
                                                                                                                                                         δÃ
                                                                                                                                                                              망
                                                                                                                                                                                                           В
                                                                                                                                                                                                                                        Dδ
                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                ρŞ
                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SSSSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Ma
Best Loc
Matches
        Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      prevent
in the f
                              Neisseria
                                             Surface antigen NhhA; meningococcal
                                                                           24-OCT-2001
                                                                                                          AAU06177
                                                                                                                                                 597
                                                                                                                                                                                             530
                                                                                                                                                                                                            477
                                                                                                                                                                                                                                          417
                                                                                                                                                                                                                                                        411
                                                                                                                                                               590
                                                                                                                                                                              537
                                                                                                                                                                                                                           470
                                                                                                                                                                                                                                                                         357
                                                                                                                                                                                                                                                                                       351
                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                     291
                                                                                                                                                                                                                                                                                                                                     237
                                                                                                                                                                                                                                                                                                                                                   231
                                                                                                                                                                                                                                                                                                                                                                   177
                                                                                                                                                                                                                                                                                                                                                                                 171
                                                                                                                                                                                                                                                                                                                                                                                                 117
                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                                                                                                                                                                                                                                                                              58
                                                           meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                             _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1
                                                                                                                                                                                                                                        ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                  ٩P
                                                                                                                                                              å
                                                                                                                                                                                     LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                          \verb|vgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiatag|
                                                                                                                                                                                                                  VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                     GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                             YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                             laqaylpgksmmaigggtyrgeagyaigyssisdtgnwvikgtasgnsrghfgasasvgy
                                                                                                                                                                                                                                                                                                                                                                                               ntnentnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          548;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       form
                                                                                                                                                              591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             or treat N. meningitidis infection in humans, especially form of vaccines. The proteins and antibodies can also to identify immunoreactive peptides.
                                                                                                                                                598
                                                                                                          standard;
                              meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                        -NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                          H15 surface antigen NhhA polypeptide sequence
               Location/Qualifiers
                                                                                                          Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  90
91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12;
                                                                                                          598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2725.5;
Pred. No. 7.96
                             н15.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                             disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 20;
e-155;
27; I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                        469
                                                                                                                                                                                                                                                                                     410
                                                                                                                                                                                            589
                                                                                                                                                                                                           536
                                                                                                                                                                                                                                        476
                                                                                                                                                                                                                                                                       416
                                                                                                                                                                                                                                                                                                      356
                                                                                                                                                                                                                                                                                                                                                  290
                                                                                                                                                                                                                                                                                                                                                                                 230
                                                                                                                                                                                                                                                                                                                                                                                                              170
                                                                                                                                                                                                                                                                                                                                                                                                                              116
                                                                                                                                                                                                                                                                                                                    350
                                                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4.
```

Qy В

MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60

mnkiyriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd---dddl

57

Н  $\vdash$  Query Match
Best Local Similarity
Matches 548; Conser

Conservative

12;

90

. 08;

Score 2725.5; Pred. No. 7.9e 12; Mismatches

2725.5; DB 22 No. 7.9e-155; ismatches 27;

Indels Length

15;

Gaps

4.

22;

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antiqen Nhha (AAU06182-AAU06186). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
Sequence
                                                                                                                                                                                                         Claim 9;
                                                                                                                                                                                                                              New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                  Peak
                                 The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain H15 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given i
                                                                                                                                                                                                                                                                                N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                  02-AUG-2001.
                                                                                                                                                                                                                                                                                                                                                                                                                                         WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                        (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                  25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                         25-JAŅ-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                               2001-488774/53.
DB; AAS09167.
                                                                                                                                                                                                        Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                  Jennings
598
                                                                                                                                                                                                                                                                                                                                                                                          2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                  2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= V4
/note= "Variable
243..598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note=
217..2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note=
51..104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label= C4
/note= "Conserved
236..242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label= C2
/note= "Conserved
117..130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= C3
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Variable
131..194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            105..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                . 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ū
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ψ
                                                                                                                                                                                                                                             or
P
                                    ij
```

```
δõ
                                                                                                                                                                                                                             DЪ
                                                                                                                                                                                                                                      2
                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                             ρ
                                                                                                                                                                                                                                                                                                                          DЪ
                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                       밁
                                         (ISIS-)
                                                           12-DEC-1997;
                                                                      14-DEC-1998;
                                                                                   24-JUN-1999
                                                                                                          Neisseria meningitidis
                                                                                                                                                  08-SEP-1999
                                                                                                                                                                         AAY23738 standard; Protein;
Neisseria meningitidis
                                                                                                                      immunoreactive
                                                                                                                                                                                                       597
                                                                                                                                                                                                                                         530
                                                                                                                                                                                                                                                     477
                                                                                                                                                                                                                                                                             417
                                                                                                                                                                                                                                                                                        411
                                                                                                                                                                                                                                                                                                   357
                                                                                                                                                                                                                                                                                                               351
                                                                                                                                                                                                                                                                                                                           297
                                                                                                                                                                                                                                                                                                                                      291
                                                                                                                                                                                                                                                                                                                                                 237
                                                                                                                                                                                                                                                                                                                                                             231
                                                                                                                                                                                                                                                                                                                                                                         177
                                                                                                                                                                                                                                                                                                                                                                                    171
                                                                                                                                                                                                                                                                                                                                                                                                117
                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                     15
                                                                                                                                       surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                       58
                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                     QW 591
11
qw 598
                   1999-418754/35
                                                                                                                                                                                                                            VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                           ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                               GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                   asgngttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvs
                                                                                                                                                                                                                                                                                                                          gkgkdengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtkvtf
                                         ISIS
             AAX85790
                                                                                                                           protein;
                              ΜP,
                                         INNOVATION QUEENSLAND.
                                                                                                                                                  (first entry)
                             Moxon
                                                                                                                      peptide.
                                                           97GB-0026398
                                                                       98WO-AU01031
                                                                                                                           surface
surface
                                               CTL
                                                                                                                           glycoprotein;
                                                                                                                                                                         598
proteins useful
                                                                                                                           infection;
for
                                                                                                                            vaccine;
treating
                                                                                                                                                                                                                                         589
                                                                                                                                                                                                                                                                                        469
                                                                                                                                                                                                                                                                                                   416
                                                                                                                                                                                                                                                                                                                                                                                                                       116
                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                     536
                                                                                                                                                                                                                                                                 529
                                                                                                                                                                                                                                                                            476
                                                                                                                                                                                                                                                                                                                          356
                                                                                                                                                                                                                                                                                                                                      350
                                                                                                                                                                                                                                                                                                                                                 296
                                                                                                                                                                                                                                                                                                                                                             290
                                                                                                                                                                                                                                                                                                                                                                        236
                                                                                                                                                                                                                                                                                                                                                                                    230
                                                                                                                                                                                                                                                                                                                                                                                                176
```

```
밁
                                                                                                      QУ
                                                                                                                               밁
                                                                                                                                                  Qγ
                                                                                                                                                                                           ρ
                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                     ρ
                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                         B
                                                            VQ
VQ
                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitidis infections
                                                                                    477
                                                                                                                               417
                                                                                                                                                     411
 597
                     590
                                         537
                                                                                                          470
                                                                                                                                                                         357
                                                                                                                                                                                             351
                                                                                                                                                                                                                   297
                                                                                                                                                                                                                                       291
                                                                                                                                                                                                                                                            237
                                                                                                                                                                                                                                                                                 231
                                                                                                                                                                                                                                                                                                       177
                                                                                                                                                                                                                                                                                                                             171
                                                                                                                                                                                                                                                                                                                                                 117
                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                      -4
                                                                                                                                                                                                                                                                                                                                                                                                                                              1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                       VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                $ = $
                                                                                                                              ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                     GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                               PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                       as {\tt gngttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvs}
                                                                                                                                                                                                                                                          {\tt gttasdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvt}
                                                                                                                                                                                                                                                                                                                                                                                                                YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                    mnkisriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd---dddl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                546;
 598
                     591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  91-93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         90.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2716.5;
Pred. No. 2.76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5; DB 20;
.7e-154;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                 176
                                            596
                                                                                     536
                                                                                                          529
                                                                                                                               476
                                                                                                                                                     469
                                                                                                                                                                          416
                                                                                                                                                                                             410
                                                                                                                                                                                                                   356
                                                                                                                                                                                                                                        350
                                                                                                                                                                                                                                                              296
                                                                                                                                                                                                                                                                                  290
                                                                                                                                                                                                                                                                                                       236
                                                                                                                                                                                                                                                                                                                             230
                                                                                                                                                                                                                                                                                                                                                                     170
                                                                                                                                                                                                                                                                                                                                                                                                                                      57
                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
```

4

Search completed: Job time: 487 sec

July

w '

08:09:01

THIS PAGE BLANK (USPTO)

442

```
#200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
Query Match
Best Local S
Matches 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The invention provides proteins (AAY27201-245) from Neisseria meningitidis (strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g. and or antibody specific to the protein are useful as pharmaceuticals.
                                                                                       The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especial in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                           surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in human
                                                                                                                                                                                 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis
                                                                                                                                                                                                                                                               Neisseria meningitidis surface
                                                                                                                                                                                                                                                                                                                                                         UQYU)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A surface protein of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAY23741 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          vaccine composition or a diagnostic composition. The composition useful for treating or preventing an infection due to Neisserial
                                                                Sequence
                                                                                                                                                                                                                         Claim 1; Page 104-106; 132pp; English.
                                                                                                                                                                                                                                                    meningitidis
                                                                                                                                                                                                                                                                                                     WPI; 1999-418754/35
                                                                                                                                                                                                                                                                                                                               Jennings
                                                                                                                                                                                                                                                                                                                                                                                                  12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                         14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
 Local Similarity 100.0%; hes 59; Conservative (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                         ) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 59;
                                                                                                                                                                                                                                                                                          AAX85793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                ¥,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              especially Neisseria
                                                                 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative (
                                                                                                                                                                                                                                                   infections
                                                                                                                                                                                                                                                                                                                                                         INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                               Moxon
                                                                 Ä
                                                                                                                                                                                                                                                                                                                                                                                                 97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              peptide
                                                                                                                                                                                                                                                                                                                                                                                                                           98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Protein;
                                                                                                                                                                                                                                                                                                                                ER,
                         9.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.8%;
                                                                                                                                                                                                                                                                                                                                Peak IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    591 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 59; DB; Pred. No. 1.7
Score 59; DB Pred. No. 1.7 0; Mismatches
                                                                                                                                                                                                                                                               proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               meningitidis.
 1.7e-49;
hes 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 20;
                         DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.7e-49;
                         20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 591;
                        Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                  especially
                                                                                                                                            humans
                                                                                                                                                                                                                                                                z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           is also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
```

0;

Indels

0

Gaps

0

BASB029 amino acid sequence

from

N. meningitidis

strain H44/76

0;

```
QΥ
DXXXXXID
                                                                                                     망
                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 12
AAY23746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                AAY57045
                                                                          RESULT
                                                                                                                                        Matches
                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                             surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A surface protein of Neisseria meningitidis
                                    AAY57045;
                                                       AAY57045
                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                          The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis
                                                                                                                                                                                                                                                                                                       Claim 1;
                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis surface proteins useful meningitidis infections
                                                                                                                                                                                                                                                                                                                                                      WPI; 1999-418754/35
N-PSDB; AAX85798.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Surface protein; surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY23746;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY23746 standard;
                  21-FEB-2000
                                                                                                                                                                                                                The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especia in the form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                               Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria
                                                                                                                                                                                                         be used to identify
                                                                                                                                                                                                                                                                                                                                                                                                 (ISIS-) ISIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                 14-DEC-1998;
                                                                                                  Immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                       standard;
                                                                                                                                                                                                                                                                                                       Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis
                                                                                                                                                                                        591
                                                                                                                                          Conservative
                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                  INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                       127-128;
                                                                                                                                                                                                                                                                                                                                                                                Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                 98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           peptide
                                                        Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Protein;
                                                                                                                                                  9.8%;
                                                                                                                                                                                                         immunoreactive peptides.
                                                                                                                                                                                                                                                                                                      132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                 Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                591
                                                        591
                                                                                                                                         0;
                                                                                                                                                  Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                       English.
                                                        ξ
                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                  DB 20; 1
1.7e-49;
                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                           Length 591;
                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                   treating
                                                                                                                                                                                                                             especially
                                                                                                                                                                                                                                                humans
                                                                                                                                                                                                                                                                                                                                    z
                                                                                                                                          0
                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               430
```

```
This is the Nisseria meningitidis BASB029 amino acid sequence from CC serogroup B strain H44/76. The BASB029 protein is homologous to the Haemophilus influenzae surface fibril (HSF) protein. The invention CC relates to BASB029 polynucleotide sequences (AAX39864-Z3985) and polypeptide sequences (AAY57044-Y57045) and their immunogenic fragments. CBASB029 polypeptides are useful in a method of diagnosing a Neisseria CC meningitidis infection in a mammal. Compositions containing BASB029 CC polynucleotides and polypeptides are useful for generating an immune response in an animal. A therapeutic composition comprising an antibody CC directed against BASB029 is useful in treating humans with Neisseria CC meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an CC the stage of infection, type of infection, susceptibility and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029 is constituted to the stage of infection and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029
                                                                                                                                                                         Query Match
Best Local Similarity
Matches 59; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Encoded by AATC" Misc-difference 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note= "Encoded
Misc-difference 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BASB029; Nisseria meningitidis; surface fibril protein; HSF; diagnosis; infection; treatment; prevent; antibacterial drug.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Misc-difference 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               New polypeptide from neisseria meningitidis useful treatment or prevention of bacterial infections in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2000-053103/04.
N-PSDB; AAZ39865.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             polynucleotides and polypeptides are also useful for treating infections. The protein is useful in the particularly bacterial infections. The protein is useful in the screening and development of antibacterial drugs. Fused recombinant protein is useful for the stimulation of the immune system of an order of the immune system of an order of the immune system of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Claim 4; Fig 2; 74pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18-NOV-1999
                                         384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
372 ydvnvgdalnvnglqnsgwnldskavagssgkvisgnvspskgkmdetvninagnniei 430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                      591
                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "Encoded 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note=
389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note=
269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note=
                                                                                                                                                                                                         9.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Encoded by AAC"
                                                                                                                                                                         0;
                                                                                                                                                                                                                       Score 59; DB 21;
Pred. No. 1.7e-49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ьу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      γď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ьγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         by AAA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                bу
                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GAT"
                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                 Length 591;
                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for diagnosis,
                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      organism
                                                                                                                                                                                   0,
```

Qy 멍

The present invention relates to

the isolation of novel

Neisseria

```
RESULT 14
AAU06171
                                                                                                                                                                                                                                                                                                   FT FT
CCCXX
                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N. meningitidis PMC21 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAU06171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAU06171 standard;
                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                             Protein
                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria
                              New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for the preventing broad spectrum of Neisseria meningitidis.
                                                                                                                                                           02-AUG-2001.
                                                                                                                                                                                                           Regior
                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Peptide
               Claim 9; Fig 1; 91pp; English
                                                                         WPI; 2001-488774/53.
                                                                                        Peak IRA, Jennings MP
                                                                                                                          25-JAN-2000; 2000US-0177917
                                                                                                                                          25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                          WO200155182-A1.
                                                                                                         UQYU)
                                                                                                        ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     antigen NhhA; meningococcal disease; meningitis vaccine
                                                                 AAS09161.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitidis strain PMC21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                                                                                                                             /label= V1
/note= "Variable region
52..591
                                                                                                                                                                                                                                                                                                                                                             109..120
                                                                                                                                                                                                                                                                                                                                                                             /note= "Predicted
                                                                                                                                                                                            /note= "Conserved region
                                                                                                                                                                                                   /label=
                                                                                                                                                                                                            237..591
                                                                                                                                                                                                                  /label= V4
/note= "Variable region
                                                                                                                                                                                                                                           /label= C4
/note= "Conserved
                                                                                                                                                                                                                                                                    /label= V3
/note= "Variable
                                                                                                                                                                                                                                                                                           /label= C3
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                            /label= C2
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                     /label= Mature_NhhA
                                                                                                                                                                                                                                                                                                                                                                                                                             /label= C1
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                      'label= Signal_peptide
                                                                                                                                                                                                                                                                                                                    'note= "Variable
                                                                                                                                                                                                                                                                                                                            label= V2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein;
                                                                                                                                                                                                                                                                                                             ..188
                                                                                                                                                                                                                                     . 236
                                                                                                                                                                                                                                                                                                                                    .124
                                                                                                                                                                                                                                                                                    210
                                                                                                                                                                                                                                                             229
                                                                                                                                                                                                                                                                                                                                                                     claimed
                                                                                                                                                                                                     C
                                                                                                                                                                                                                                                                                                                                                                    ted mature protein, specifically in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ß
                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                      2,
                                          treating
```

```
Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Total number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
         Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
2231.5
2231.5
2231.5
2231.5
2231.5
2230.5
2230.5
2230.5
2230.5
2230.5
2230.5
2230.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
2331.5
23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                seq length:
seq length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Issued_Patents_AA:*
1: /cgn2_6/ptodata/2
2: /cgn2_6/ptodata/2
3: /cgn2_6/ptodata/2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6.5.4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Match Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query
   US-09-771-382-11
2499
1 MNXIXRIIWNSALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                231628 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      July
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MNXIXRIIWNSALNAWVXVS.....TASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         w
`
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2000000000
      \begin{array}{c} 598 \\ 598 \\ 598 \\ 698 \\ 698 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\ 699 \\
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2002, 08:10:21; Search time 64.11 Seconds (without alignments) 230.121 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24425594 residues
US-09-377-155-5
US-09-669-974-13
US-09-377-155-19
US-09-377-155-15
US-09-669-974-15
US-09-669-974-15
US-09-669-974-11
US-09-669-974-21
US-09-669-974-21
US-09-669-974-21
US-09-669-974-21
US-09-669-974-7
US-09-689-974-7
US-09-69-974-7
US-09-69-974-7
US-09-69-974-7
US-09-69-974-7
US-09-69-974-7
US-09-69-974-7
US-09-69-974-7
US-09-69-974-7
US-09-69-974-7
US-09-69-974-33
US-09-689-974-33
US-09-689-974-33
US-09-689-974-33
US-09-689-974-33
US-09-689-974-33
US-09-689-974-33
US-09-689-974-33
US-09-689-974-33
US-08-689-974-33
US-09-689-974-33
US-08-689-974-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          231628
                        Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                  Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
5, Appli
3, Appli
13, Appli
19, Appl
19, Appl
15, Appl
15, Appl
11, Appl
11, Appl
21, Appli
21, Appli
22, Appli
33, Appli
34, Appli
37, Appli
38, Appli
39, Appli
31, Appli
31, Appli
31, Appli
32, Appli
33, Appli
33, Appli
33, Appli
33, Appli
33, Appli
34, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              604
```

; NUMBER OF SEQ ID NOS: 33 ; SOFTWARE: Patentin Ver. 2.0 ; SEQ ID NO 5 ; LENGTH: 598 ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-377-155-5

FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 199-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14

PRIOR APPLICATION NUMBER: GB 9
PRIOR FILING DATE: 1997-12-12

GB 9726398.2

APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE AN

SURFACE ANTIGEN

		-	xESULT 1 15-09-377-155-5 . Sequence 5. Application US/09377155	RESULT 1 JS-09-377-155: Sequence 5,
	ALIGNMENTS			
Sequence 28, App.	1104 4 US-09-268-347-28		513	<u>4</u> 5
24,	1002 4 US-09-268-347-24	22.3	558	4.4
•	1004 4 US-09-268-347-30		583	43
•	c		754.5	42
٠	4 U		754.5	41
Sequence 32, Appl	4		825	40
Sequence 4, Appl:	ω		857	39
Sequence 4, Appl:	۳		857	38
Sequence 6, Appl:	4		857	37
	w		857	36
	607 1 US-08-409-995-6		857	35
	4		876	34
	w		876	33
Sequence 5, Appli	_		876	32
	4	2	880	31
Sequence 32, Appl	4	.2	880	30
Sequence 2, Appl:	1098 4 US-08-913-942-2	'n	880	29
Sequence 32, App.	1098 4 US-09-377-155-32	N	880	28

Qy 밁 Qy В Qγ В Qy 밁 20 밁 Matches 469; Query Match 89.4%; Best Local Similarity 77.6%; 177 181 117 301 VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV 121 58 61 GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL 300 TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX 240 NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180 GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP YLEPVQRTAVVLSFRSDKEGTGEKE-GTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQ Conservative 0; Score 2235; DB 4; Pred. No. 2.2e-214; Mismatches 129; Length 598; Indels 6, Gaps 236 176 ω ••

ga

Š

밁

8

Qγ 망

B Qy B QΥ Вþ

```
RESULT 2
US-09-669-974-5
                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 5
LENGTH: 598
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 5, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                           ORGANISM: Neisseria meningitidis - 09-669-974-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION NUMBER: GB 9726398.2 PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  295
                                                                                           117
                                                                                                                       121
                                                                 181
               241
                                                                                                                                                                           61
                                                                                                                                                 58
                                                                                                                                                                                                    GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AGLAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                     TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                            NTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                    XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                YLEPVQRTAVVLSFRSDKEGTGEKE-GTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                            GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                          469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              598
                                                                                                                                                                                                                                                          Conservative
89.48;
                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                      Score 2235; DB 4;
Pred. No. 2.2e-214;
                                                                                                                                                                                                                                                          Mismatches 129;
                                                                                                                                                                                                                                                                                    Length 598;
                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                          6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    594
                                                                                             176
                                                                                                                                                   116
                                          236
                                                                                                                                                                                                                                                            ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вp
  Š
                              밁
                                                   Qy
                                                                                  밁
                                                                                                         Qy
                                                                                                                                      Db
                                                                                                                                                              δÃ
                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                   SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
    241
                              177
                                                        181
                                                                                  117
                                                                                                              121
                                                                                                                                                                  61
                                                                                                                                                                                             ب
```

Ş

δÕ

밁 Ş

Вþ

δÃ В

δõ В

```
; TYPE: PRT
; ORGANISM: Neisseria
US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 13, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity
Matches 469; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQ ID NO 13
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRIOR APPLICATION NUMBER: GB : PRIOR FILING DATE: 1997-12-12 NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 199-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION: FILE REFERENCE: 069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: PEAK, Ian Richard
APPLICANT: JENNINGS, Michael
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       595 GYQW 598
                                                                                                                                                                                                                                                          1 MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXX 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL
GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                             TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX 240
                                                                                                  NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                  XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                   YLEPVQRTAVVLSFRSDKEGTGEKE-GTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                     MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQA----NATDDDDL
                               PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis
                                                                                                                                                                                                                                                                                                                         89.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GB 9726398.2
                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                           Score 2234; DB 4;
Pred. No. 2.8e-214;
0; Mismatches 129;
                                                                                                                                                                                                                                                                                                               129;
                                                                                                                                                                                                                                                                                                                                           Length 598;
                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                        6;
                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     360
                                                                                                                                                                         116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                534
                                                                                                       176
                                                                                                                                                                                                                                               57
```

, ω

```
В
                                                                 δÃ
                                                                                            Дb
                                                                                                                   δÃ
                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-669-974-13

: Sequence 13, Application US/09669974

; Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                Š
                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                  ; ORGANISM: Neisseria meningitidis US-09-669-974-13.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                  Query Match
Best Local S
Matches 469
                                                                                                                                                                                                                                                                                                       SOFTWARE: PatentIn Ver. SEQ ID NO 13
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION NUMBER: GB 9726398.2 PRIOR FILING DATE: 4997-12-12 NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                          LENGTH: 59
TYPE: PRT
                181
                                          117
                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               237
                                                                                            58
                                                                                                                     61
                                                                                                                                                                                                             Local Similarity
                                                                                                                                               _
                                                                                                                                                                        ب
                                                                                                                                            GYOW
GYQW 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                           YLEPVQRTAVVLSFRSDKEGTGEKE-GTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                     LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VTGKGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKV
                                                     XXXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     604
                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                            89.48;
77.68;
                                                                                                                                                                                                                                                                                                                                  2.0
                                                                                                                                                                                                  0;
                                                                                                                                                                                                Score 2234; DB 4;
Pred. No. 2.8e-214;
0; Mismatches 129;
                                                                                                                                                                                                                           Length
                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                           598;
                                                                                                                                                                                                 6;
                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                        176
                                                                                                                  120
                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    474
                                                                                                                                               57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              294
                                                                                                                                                                                                 ω
••
```

```
Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 5
US-09-377-155-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                             Вb
                                                       Ş
                                                                                        밁
                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      덩
δã
                                                                                                                                                                                                                                                                                   US-09-377-155-19
                                                                                                                                                                                                                                                                                                             SOFTWARE: Par
SEQ ID NO 19
LENGTH: 589
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anse
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
APPLICANT: MOXON, E. ROYEL SURFACE
TITLE OF INVENTION: NOVEL SURFACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 19, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                         Query Match
Best Local Similarity
Matches 469; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                 CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
                                                                                                                                                                                                                                                                                                                                                                        PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILE REFERENCE:
                                                                                                                                                                                                                                                                                                   ORGANISM: Neisseria
 181
                              118
                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   295
                                                                                        59
                                                                                                                     61
                                                                                                                                               GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX 240
                                                                                                         GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTGKGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKV 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                          XXXXXXXXXXXXTTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                      ELESVARSALVLQFMIDKEGNGEIE-STGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA
                                                                                                                                                                                                                                                                                                                                                             PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PEAK, Ian Richard Anselm
                                                                                                                                                                                                            Conservative
                             SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 065064/0128
                                                                                                                                                                                                                                                                                                 meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                          89.3%;
77.6%;
                                                                                                                                                                                                                                                                                                                                                                                                         GB 9726398.2
                                                                                                                                                                                                          0;
                                                                                                                                                                                                         Score 2231.5; DB 4;
Pred. No. 4.9e-214;
0; Mismatches 120;
                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                         589;
                                                                                                                                                                                                            15;
                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          480
                                                                                        117
                                                                                                                                                 58
                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           294
                             167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      236
                                                                                                                                                                                                            4;
```

167

```
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE OF INVENTION: NOVEL SURFACE ANTIGEN
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: US 75/4098/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
                                                               οy
                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 6
US-09-669-974-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
              Š
                                         밁
                                                                                                                     Ş
                                                                                                                                                                                                                    ; TYPE: PRT
; ORGANISM: Neisseria
US-09-669-974-19
                                                                                                                                                              Query Match
Best Local :
                                                                                                                                                                                                                                                            SEQ ID NO 19
LENGTH: 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 19, Application US/09669974 Patent No. 6333173
                                                                                                                                                   Matches 469;
                                                                                                                                                                                                                                                                                       NUMBER OF SEQ ID NOS: 33 SOFTWARE: PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           586 GYQW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                          59
                                                                                                                                                                Local Similarity
                                                                    GYOW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   XXXXXXXXXXXXXTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                             AGLAQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                       ELESVARSALVLQFMIDKEGNGEIE-STGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ 117
                                                                                                                                                  Conservative
                                                                                                                                                                                                                                  meningitidis
                                                                                                                                                              89.3%;
                                                                                                                                                  0;
                                                                                                                                                              Score 2231.5; DB 4; Pred. No. 4.9e-214;
                                                                                                                                                   Mismatches 120;
                                                                                                                                                   Indels
                                                                                                                                                                           Length 589;
                                                                                                                                                   15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     525
                                                                                                                                                   4;
                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 055064/0128
CURRENT PILING DATE: 1999-08-19
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOSTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
 Š
                             망.
                                                    QΥ
                                                                                DЪ
                                                                                                        δÃ
                                                                                                                                                                                                       ; ORGANISM: Neisseria meningitidis US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                 SEQ ID NO 15
LENGTH: 599
TYPE: PRT
                                                                                                                            Query Match
Best Local Similarity 77.6
Chas 469; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 15, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           118 -----SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              601 GYQW 604
                               59
                                                        61
                                                                                  Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXX 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT 540
  XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                   MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQA--NATDEDEEE 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIAT
                                           ELEPVVRSALVLQFMIDKEGNGENE-STGNIGWSIYYDNHNTLHGATVTLKAGDNLKIKQ 117
                                                                                                                                                    89.3%;
77.6%;
                                                                                                                                     Score 2231.5; DB 4; Length Pred. No. 5e-214; 0; Mismatches 130; Indels
```

w ••

525

405 420 345 360 285 300

```
망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
             γ
                                                            Qy
                                                                                                                                                    ; TYPE: PRT
; ORGANISM: Neisseria
US-09-669-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-669-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                        Query Match
Best Local Similarity
Matches 469; Conserv
                                                                                                                                                                                        SOFTWARE: PatentIn Ver.
SEQ ID NO 15
LENGTH: 599
                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 15, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                     CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILLING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILLING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
                                                                                                                                                                                                                                                                                                                                                      APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                             PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                             FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            118
              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                   GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VTGKXKXENXSSTDXGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
GYQW 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTT--ASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        {\tt TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKP}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NTNKNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDKGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           604
                                                                                        Conservative
                                                                                                                                                               meningitidis
                                                                                                 89.3%;
77.6%;
                                                                                                                                                                                                                    2.0
                                                                                      0;
                                                                                      Score 2231.5; DB
Pred. No. 5e-214;
0; Mismatches 13
                                                                                      130;
                                                                                                               DB 4;
                                                                                      Indels
                                                                                                               Length
                                                                                                               599;
                                                                                      5
                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             480
                                    58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         237
                                                                                      Ψ
```

```
; SOFTWARE: PatentIn Ve
; SEQ ID NO 11
; LENGTH: 591
; TYPE: PRT
; ORGANISM: Neisseria m
US-09-377-155-11
                           В
                                                         Qy
                                                                                                                                                                                                                                                     APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: CT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 9
US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 11, Application US/09377155 Patent No. 6197312
                                                                                         Query Match
Best Local Similarity
Matches 469; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     601 GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  59
 -
                                                          ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX 240
                              MNEILRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                              MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LNYGSKXXNKPVRITNVAPGYKEGDYTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NTNKNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ELEPVVRSALVLQFMIDKEGNGENE-STGNIGWSIYYDNHNTLHGATVTLKAGDNLKIKQ
                                                                                                                                                                                                                                             PatentIn Ver. 2.0
                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                   NOVEL SURFACE ANTIGEN
                                                                                                                                                                                meningitidis
                                                                                                       89.3%;
                                                                                         Score 2230.5; DB 4
Pred. No. 6.1e-214;
0; Mismatches 122;
                                                                                                                     DB 4;
                                                                                                                       Length
                                                                                         13;
                                                                                         Gaps
                              60
                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          237
                                                                                          ω
••
```

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
 밁
                            Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 21, Application US/09377155 Patent No. 6197312
                                                             Matches
                                                                                                                                                                                                SEQ ID NO 21
                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-13
                                                                                                                                       LENGTH: 591
TYPE: PRT
ORGANISM: Neisseria
-09-377-155-21
                                                                                                                                                                                                                                                                                                                                   APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE A
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61 YLDPVLRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
               1 MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXX 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTT - - ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                                           469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVD-GDA 467
                                                                                                                                                                                                              PatentIn Ver. 2.0
                                                             Conservative
                                                                                                                                                                                                                                                                                                                                     O65064/0128
                                                                                                                                                     meningitidis
                                                                      89.3%;
                                                          Score 2230.5; DB 4;
Pred. No. 6.1e-214;
0; Mismatches 122;
                                                                                      Length 591;
                                                          13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                          w
```

δÃ

1 MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXXXXX

Matches

469;

Conservative

0;

Indels

13;

Gaps

ω ••

Similarity

```
; ORGANISM: Neisseria meningitidis US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 11
US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                    SEQ ID NO 11
                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                        Sequence 11, Application US/09669974 Patent No. 6333173
             Query Match
Best Local
                                                                                                                                                                                                                                                                  APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT FILING DATE: 2000-09-26
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                           PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                  NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
                                                                                                        TYPE: PRT
                                                                                                                     LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               588 GYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVD-GDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 89.3%;
77.6%;
Score 2230.5; DB 4;
Pred. No. 6.1e-214;
0; Mismatches 122;
                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   527
```

ω ••

```
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 21
LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 12
US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                           ; ORGANISM: Neisseria meningitidis US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                뭉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                       Sequence 21, Application US/09669974 Patent No. 6333173
 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                   APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               171
                                                                                                                                                                                                                                                                                                                                                                                                                                                              588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TEASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YLDPVLRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVD-GDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
 89.3%;
77.6%;
Score 2230.5; DB 4
Pred. No. 6.1e-214;
               Length
               591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             230
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
; ORGANISM: Neisseria
US-09-377-155-9
                                                                                                                                                                                                                                                            RESULT 13
US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                               뭥
                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                NUMBER PAT SOFTWARE: PAT ; SEQ ID NO 9
                                                                                                                                                                                                                                   Sequence 9, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                         GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches 469;
                                                                                                                                                                      APPLICANT: PEAK Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE AN
                                                                                                          CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AN098/01031
PRIOR FILING DATE: 1998-12-14
                                                           NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
                                                                                  PRIOR APPLICATION NUMBER: GB PRIOR FILING DATE: 1997-12-12
                                                                                                                                                             FILE REFERENCE:
                                                                                                                                                                                                           APPLICANT:
                        TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                       601
                                                                                                                                                                                                                                                                                                                                                               528
                                                                                                                                                                                                                                                                                                                                                                                                               468
                                                                                                                                                                                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                                                                                                                                                                                               409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                              588 GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL 300
                                                                                                                                                                                                                                                                                                                                                             LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                               VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVD-GDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       XXXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                       604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                             065064/0128
                                                                                                                                                                         NOVEL SURFACE ANTIGEN
          meningitidis
                                                                                               GB 9726398.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches 122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                               587
                                                                                                                                                                                                                                                                                                                                                                                                                                                               467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
```

77.6%;

4;

Query Match Best Local

Local Similarity

89.2**%**; 77.6**%**;

Score 2230; DB 4; Pred. No. 6.9e-214;

Length

4;

```
PRIOR APPLICATION NUMBER: US 09/377,155

PRIOR FILING DATE: 1999-08-19

PRIOR APPLICATION NUMBER: US 09/377,155

PRIOR APPLICATION NUMBER: PCT/AU98/01031

PRIOR FILING DATE: 1998-12-14

PRIOR APPLICATION NUMBER: GB 9726398.2

PRIOR APPLICATION NUMBER: GB 9726398.2

NUMBER OF SEQ ID NOS: 33

SOFTWARE: Patentin Ver. 2.0
; ORGANISM: Neisseria
US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                          QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  дδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                    US-09-669-974-9
                                                                                                                                                                                          GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE A
                                                                                                                                                                                                                                                          Sequence 9, Applic Patent No. 6333173
                       SEQ ID NO 9
LENGTH: 594
TYPE: PRT
                                                                                                                                                        FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                     591
                                                                                                                                                                                                                                                                                                                                                            601
                                                                                                                                                                                                                                                                                                                                                                                    531
                                                                                                                                                                                                                                                                                                                                                                                                                                     471
                                                                                                                                                                                                                                                                                                                                                                                                             541
                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity 77.6 nes 469; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GYQW 594
                                                                                                                                                                                                                                                                                                                                                            GYOW 604
                                                                                                                                                                                                                                                                                                                                                                                                AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                    TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                   LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----NTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Application US/09669974
            meningitidis
                                                                                                                                                                                              SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pred. No. 6.9e-214;
0; Mismatches 125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                           600
                                                                                                                                                                                                                                                                                                                                                                                                                                                            540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    57
```

```
RESULT 15
US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                        Sequence 7, Application US/09377155 Patent No. 6197312 GENERAL INFORMATION:
                                              SOFTWARE:
SEQ ID NO 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches 469;
                                                                          CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 199-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                               APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE AL
FILE REFERENCE: 065064/0128
LENGTH: 594
TYPE: PRT
ORGANISM: Neisseria
                                                                                                                                                                                                                                                                                                                                                                591
                                                                                                                                                                                                                                                                                                                                                                                            601
                                                                                                                                                                                                                                                                                                                                                                                                                            531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXX 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                                                                                                                                GYQW
                                                                                                                                                                                                                                                                                                                                                                                            GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LNVGSKDANKPYRITNVAPGVKEGDYTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----NTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAE 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQA---STTDDDDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                               PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches 125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       57
                                                                                                                                                                                                                                                                                                                                                                                                                             590
```

meningitidis

US-09-377-155-7

Query Match 89.0 Best Local Similarity 77.6 Matches 469; Conservative

89.0%; Score 2223; DB 4; 77.6%; Pred. No. 3.5e-213; tive 0; Mismatches 125;

Indels Length 594;

10;

Gaps

4.

116

172

```
δõ
                                                              В
                                                                           QV
                                                                                             В
                                                                                                          δÃ
                                                                                                                           Вb
                                                                                                                                          Qy
                                                                                                                                                            Ъ
                                                                                                                                                                       δõ
                                                                                                                                                                                          В
                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                        В
                               밁
                                             Qγ
               601
                                531
                                               541
                                                               471
                                                                              481
                                                                                              411
                                                                                                             421
                                                                                                                             351
                                                                                                                                             361
                                                                                                                                                            291
                                                                                                                                                                           301
                                                                                                                                                                                           233
                                                                                                                                                                                                          241
                                                                                                                                                                                                                          173
                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                         117
                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                         58
                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                     VTGKXKXENXSSTDXGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV 360
                                                                                                                                                                                         GYQW 604
                              AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV 600
                                                                      LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT 540
                                                                                           VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                           ----NTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                 XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                        YLEPVQRTAVVLSFRSDKEGTGEKE-GTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                       GYQW 594
                                                              LNVGSKDTNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
```

530

Search completed: July Job time: 535 sec ω 2002, 08:10:23

THIS PAGE BLANK (USPTO)

GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd

OM protein - protein search, using sw model

Run on: July 3, 2002, 08:12:32; Search time 95.27 Seconds (without alignments) 609.194 Million cell updates/sec

Title: Perfect score:

Sequence: US-09-771-382-11 2499 1 MNXIXRIIWNSALNAWVXVS.....TASGNSRGHFGXSASVGYQW 604

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

Searched: 283138 seqs, 96089334 residues

Total number of hits satisfying chosen parameters: 283138

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

PIR\_71:\*
1: pir1:\*
2: pir2:\*
3: pir3:\*
4: pir4:\* pir1: \*
pir2: \*
pir3: \*
pir4: \*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

. 62	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	80	7	6	5	4	u	2	1	NO.	Result	
133.5	134	135	135	135	135.5	136	136	137	137	137.5	137.5		140	142.5	142.5	142.5	146.5	154	173	278.5	287.5	299.5	299.5	319	326	465	2221	30	Score		
ۍ د د	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.5		5. 5						5.7	5.9	6.2	6.9	11.1		12.0	12.0	12.8		18.6	88.9	89.3	Match I		ф
1361	585	5291	1910	1651	1430	5188	585	1341	1052	4919	1335	1275	1300	1655	1567	364	936	365	1004	1107	658	1588	1588	2059	1190	298	592	591	Length D		
2	N	N	N	N	Ν	Ν	N	Ν	N	Ν	Ν	Ν	Ν	N	N	N	N	N	Ν	Ŋ	2	N	Ŋ	Ν	N	Ν	Ν	Ν	DB		
T03415	F90961	F90696	AF0394	JC1340	AF0351	B85547	F85809	Н98323	AF2959	T31105	T17508	T33369	S07575	E97835	S11672	A81019	140711	AB3486	C82672	AC0976	AH0110	н91188	A86036	D82671	A82615	164138	A81888	G81133	ID		
S-layer protein -	flagellin [importe	hypothetical prote	probable adhesin h		probable autotrans			hypothetical prote				hypothetical prote	outer membrane pro			sin/invasir	sapB protein - Cam	cell surface prote	ന	autotran	surface		e adhesin	protein		adhesin homolog HI	e surface	adhesin NMB0992 [i	Description		

444	410	36 38	ω ω ω ω 4 τ	30 31 32
125.5 125 124	127 127 127 126.5	129 128.5 128.5	130 129.5 129	133 131.5 130.5
5.00	5.111	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	5 5 5 2 2 2	υ υ υ ν υ υ
1109 893 485	1428 4936 1608	1536 605 1369	989 3705 1127	3013 3029 1477
222	0000	2 22 22 22	2 2 2	000
A56143 A37284 A60610	AC2224 AH2515 A28182	A43855 T33913 T17504	D89852 AD0123 T25804	AB0480 S76109 B43855
surface-array prot surface-array prot circumsporozoite p	hypothetical prote hypothetical prote hemolysin A - Serr	ົ່ວ	fibrinogen-binding probable autotrans hypothetical prote	probable invasin Y hypothetical prote high-molecular-wei

## ALIGNMENTS

adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B)
C;Species: Neisseria meningitidis
C;Date: 31-Mar-2000 #sequence\_revision 31-Mar-2000 #text\_change 19-Jan-2001
C;Accession: G81133
R;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B.
Li, H.; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Plzza, M.
Science 287, 1809-1815, 2000
A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.;
A;Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58.
A;Accession: G81133
B;Acteronce number: A81000; MUID:20175755 A;Status: preliminary
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1-591 <TET>
A;Cross-references: GB:AE002450; GB:AE002098; NID:g7226229; PIDN:AAF41395.1; PID:g722
A;Experimental source: serogroup B, strain MC58
C;Genetics: A; Gene: NMB0992

Qy	Db	νQ	Db	Qy	Db	Qy	Db	Qy	Db	Qy	Db	Qy	M C	μÖ
361	289	301	231	241	171	181	121	121	61	61	1	1	tches	Query Match
361 TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420	_	301 VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV 360	GTT ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL	GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL 300	TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKK	TIGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG	121 XXXXXXXXXXXXXXTTYSLKKXLXXXXXXYXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180	YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ	XLXXVXRXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXX 60	Matches 469; Conservative 0; Mismatches 122; Indels 13; Gaps	similarity 77 68:
420	348	360	288	300	230	240	170	180	120	120	60	60	ps	
						•							<b>ω</b> ;	

```
RESULT 2
A81888
probable surface fibril protein NMA1200 [imported C:Species: Neisseria meningitidis C:Species: Neisseria meningitidis C:Species: Neisseria meningitidis C:Accession: A81888
R;Parkhill, J.; Achtman, M.; James, K.D.; Bentley: Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Holroyd, S.; Jagels, C. 2000
A;Title: Complete DNA sequence of a serogroup A s A;Reference number: A81775; MUID:20222556
A;Accession: A81888
A;Status: preliminary A;Molecule type: DNA A;Residues: 1-592 <PAR>A;Residues: 1-592 <PAR>A;Cross-references: GB;AL162755; GB;AL157959; NID A;Experimental source: serogroup A, strain Z2491 C;Genetics: NMA1200
                                                       ф
                                                                                 δÃ
                                                                                                                  В
                                                                                                                                         Qy
                                                                                                                                                                         Дb
                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
 밁
                     Q
                                                                                                                                                                                                                                     рь
                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                              171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    528
   349
                           361
                                                                                      301
                                                                                                                                                241
                                                                                                                                                                                                           181
                                                                                                                                                                                                                                        115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 349
                                                         289
                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                59
                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GYOW
            TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420
                                                     GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL 300
                                                                                                                                                                         TIGDTTVHLIGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKT
                                                                                                                                                                                          TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                    XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                  ----NTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                      AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
TFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQA--NATDEDEEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVD-GDA
                                                                                                                                                                                                                                                                                             ELESVQR-SVVGSIQASMEGSGELE---TISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQ 114
                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              fibril protein NMA1200 [imported]
                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                               88.9%;
77.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nce of a serogroup A strain MUID: 20222556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GB:AL157959; NID:g7379742; PIDN:CAB84461.1; A, strain Z2491
                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                  Score 2221; DB 2;
Pred. No. 8.2e-149;
0; Mismatches 123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    05-May-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bentley, Moule, S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S.D.; Churcher, C.;
Mungall, K.; Quail,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of Neisseria menigitidis Z2491.
                                                                                                                                                                                                                                                                                                                                                                                                                  12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    02-Feb-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Klee,
M.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     467
                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PID: 973798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S.R.; More
Rajandream
                                                                                                                                                                                                                                                                                                                                                                                                                  5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 224
```

Ġ

surface protein XF1981 [imported] - Xylella fastidiosa (strain 9a5c) C;Species: Xylella fastidiosa (C;Species: Xylella fastidiosa C;Date: 18-Aug-2000 #sequence\_revision 20-Aug-2000 #text\_change 20-Aug-2000 C;Accession: A82615 R;anonymous, The Xylella fastidiosa Consortium of the Organization for Nucle

the Organization for Nucleotide

Seg

RESULT A82615

```
A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, A;Title: Whole-genome random sequencing and ass A;Reference number: A64000; MUID:95350630 A;Accession: I64138 A;Status: nucleic acid sequence not shown; transport transport
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                adhesin homolog HI1732 - Haemophilus influenzae (strain Rd KW20)
C;Species: Haemophilus influenzae
C;Species: Haemophilus influenzae
C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 24-Oct-1997
C;Accession: I64138
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage
GCCayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weidman
D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M.
Science 269, 496-512, 1995
                        δÃ
                                                                       밁
                                                                                                     Qy
                                                                                                                                           В
                                                                                                                                                                         QΥ
                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Cross-references: GB:U32846; GB:L42023;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type: DNA
A; Residues: 1-298 <TIGR>
                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           469
                                   292
                                                                                                                                            152
                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                       y Match
Local :
                                                                                                                                                                                                                  99
                                                                                                                                                                                                                                                                                         50
                                                                                                                                                                                                                                                                                                                         61
VIKDNNGKLLTGKQLKDANTGT
                                   VIKEKDGKLVTGKXKXENXSST
                                                                                                         NIKGVK--XGXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTS
                                                                                                                                                                              FAKXTAXTNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGW
                                                                                                                                                                                                                                                                                                                                                                                MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXX 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                       NIKGAKVAGGNT----ENVDLVAGYDNVEFITGDKNTLDVVLTAKENGKTTEVKFTPKTS
                                                                                                                                            LAK---GTNGDTAVHLNGLASTLPD-VTTNTGASTSVTFSPSDIEKTRAATIKDVLNAGW
                                                                                                                                                                                                                                                                                                              MNKIFKVIWNVVTQTWVVVSELTRAHTKRTSATVATAVLATVLSATVQA---
                                                                                                                                                                                                                                                      XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXAN-----XXKVNIXSDTKGLN 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VSPSKGKMDETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGA 468
                                                                                                                                                                                                                                                                                                                                                                                                                                   h 18.6%;
Similarity 37.6%;
21; Conservative 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              592
                                                                                                                                                                                                                                                                                      ----INDAGTFYKYQSTEDDIEDSAATKDDNKNQALKAGDTLTLKAGKNLKAK-
                                                                                                                                                                                                                  -LDQGGKSVTFALAKDLDVKTAKVSDTLTIGGNTPAAGGATPKVSITSTADGLK
                                                                                                                                                                                                                                                                                                                                                                                                                                      26;
                                   313
                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 465; DB 2;
Pred. No. 1.2e-25;
6; Mismatches 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NID: g1574588;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      all, K.V.;
d assembly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   translation
                                                                                                                                                                                                                                                                                                                                                                                                                                        129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Fraser, C.M.; Smith, H.O.; of Haemophilus influenzae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PID:g1574589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   shown
                                                                                                                                                                                                                                                                                                                                                                                                                                      46;
                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                  151
                                                                                                                                                                                                                                                                                         98
                                                                                                                                                                                                                                                                                                                                                               49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     600
                                                                                                                                                                              233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    588
                                                                                                                                            207
                                                                         263
                                                                                                                                                                                                                                                                                                                                                                                                                                    7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Rd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Vente
```

```
submitted to GenBank, June 2000
A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frobn J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigr Chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, E.A.; Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.F. Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silveir M.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; A, Reference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: GB:AE004017; GB:AE003849; NID:g9107083; PIDN:AAF84783.1; A;Experimental source: Strain 9a5c
R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvar Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M. as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
                                                                                                                                                             Вþ
                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                            Db
                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Note: for a complete list of authors see reference number A59328 below A;Accession: A82615 A;Status: preliminary
surface protein XF1529 [imported] -
C; Species: Xylella fastidiosa
                                                     D82671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C;Genetics
A;Gene: XF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Contents: annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Title: The genome sequence of the plant pathogen Xylella fastidiosa. A;Reference number: A82515; MUID:20365717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                       1127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1012
                                                                                                                                                                                                                                                                                                                                                                                                                                  485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          922
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      158 ANXXKVNIXSDTK--GLNFAKXTAXTNG---DXTVHLNGIGSTLTDXLXXXXXXXXXXXXX 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
                                                                                 S
                                                                                                                                                             GYOW
                                                                                                                                                                                                                  GYOW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LNVNQL----QNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIXRNGK 447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VESKDNGKXTEVKIGAKTSVIKEKDGKLVTGK-XKXENXSSTDXGEGLVTAKEVIDAVNK 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               XXTXXXXRAASXKDVLNAGWNIKGVKXGXTXXXXXNVDFVXTYDTVEFLSADTKTTTVN 272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SNDVLFNLSSSLKLDKLTVGDTVMTTNGVTVGSGVTLGSMGLVITDGPSVTSSGINAGSQ 817
                                                                                                                                                                                                                                                                       ANLPQAYIPGRGMTSVGVSSYRGQSAIAVGVSSVSESGRWVFKFSGSANTRSQVGIGAGV
                                                                                                                                                                                                                                                                                                                       AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV 600
                                                                                                                                                                                                                                                                                                                                                                            SAGSER---QVTNVAAGTADTDAVNVSQLNQGLITAKQYTDGVVGSLRRDTDGGVAAAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                            SKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNAR----AGIAQAIAT 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---SATPIAAGVDATAIGVGATASGADSIAMGNKASASADNAVAIGNHSVADRANTVSVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NIDIATSMXPQFSSVSLGAGADA------PTLSVDXXXAL------NVG 484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VNLRQLDRVAQDANRYVDNKIESLSEGQTF------VKVNSLNN------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AGWRMKTTTANGQTGQADKFETVTSGTXVTFASGXGTTATVSKDDQGNITVXYDVNVGDA 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDGATGTRSIAVGVGTLASA----EGATAVGSGAAASGKGSTAIGRNAVASADGSVALGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KITNV----AAGTAD--TDAVNLSQLNTAMAGSGAKSVHYYSTYD-----GGTQGGNYN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -GAKDGARGAESYTGKYSGLQNNTVGTVSVGDASKGETRTVS-----NVADAKEAT--DA
                                                                                                                                                             1190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 326; DB 2;
Pred. No. 3.6e-15;
                         xylella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                         fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1190
                         (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Alvarenga,
, D.M.; Car
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSPDB:GN00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Carrer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   R.;
```

```
A,Experimental source: strain 9a5c

A,Experimental source: strain 9a5c

R;Simpson, A,J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R. R;Simpson, A.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer as Neto, E.; Dueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer as Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.; authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; La chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martino and the strain and the 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000 C;Accession: D82671
A; Reference number: A85480; A; Accession: A86036
                                            A; Title: Genome sequence of enterohemorrhagic Escherichia A; Reference number: A85480; MUID:21074935; PMID:11206551
                                                                                                                                                                                              C;Accession: A86036
R;Perna, N.T.; Plunkett III, G.; Burland,
                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Residues: 1-2059 <SIM>
A;Cross-references: GB:AE003982; GB:AE003849; NID:g9106554; PIDN:AAF84338.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Title: The genome sequence of the plant pathogen A; Reference number: A82515; MUID:20365717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R;anonymous, The Xylella fastidiosa Consortium of Nature 406, 151-157, 2000
                                                                                                                     iller, L.; Grotbeck, E.J.; Davis, N.W.; Lim, Nature 409, 529-533, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Accession: D82671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Note: for a complete list of authors see reference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1926
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GYSSISXXGNWXIKGTASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AKDGGRGAESYTGKYSGVQNNTVGTVSVGDAAKGETRSISNVAD----AKEAMDAVN--- 1844
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GVSAVSESGHWVFKFSGSANTRSHVGVGAGVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GVAQNLNNXIDNVXGNAR----AGIAQAIATAGLXQAYLPGKSMMAIGGXTYXGEAGYAI 569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SVADRANSVSVGSG-:----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ASSYKGMGVN----AMAIGTNAAVSGTESVALGK---NTNVSADNAVAIG-NG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDIAT 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LRQLDAVAQKSNLQTDDM---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKDNGKXTEVKIGAKTSVIKEKDGKLVTG-KXKXENXSSTDXGEGLVTAKEVIDAVNKAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SMXPQFSSVSLGAGADAPTLSVDXXXALNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLK 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WRMKTTTANGQTGQADKFETVTSGTXVTFASGXGTTATVSKDDQGNITVXYDVNVGDALN 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QGLITAKQYTDGMVGNLRRETSGGVAAAIATANLPQAYVQGRGMTSVGVSSYQGQSAIAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 319; DB 2; Lo; Pred. No. 2.1e-14; 48; Mismatches 118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----GSER-----QVTNVAAGTADTDAVNVSQLN
                                                                                                                                                                                                      V.; Mau, B.;
                                                                                                                                                         A.; Dimalanta,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     --RHEINNIEDVFKITKGD--S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the Organization for Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             xylella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 2059;
                                                                                                                                                         Glasner, J.D.; Rose, anta, E.; Potamousis,
                                                                                    coli 0157:H7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A59328 below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1925
                                                                                                                                                         D.J.;
K.; Aj
                                                                                                                                                         .; May
Apoda
                                                                                                                                                                                                                                                                                                                                                            EDL93
```

```
A; Molecule type: DNA
A; Molecule type: DNA
A; Residues: 1-1588 <HAY>
A; Residues: 1-1588 <HAY>
A; Cross-references: GB:BA000007; PIDN:BAB37903.1; PID:g13363955; GSPDB:GN00154
A; Cross-references: GB:BA000007; PIDN:BAB37903.1; PID:g13363955; GSPDB:GN00154
                                                                                                                                                                                                                                                                                                                                          probable adhesin ECs4480 [similarity] - Escherichia coli (strain O157:H7, substrain C:Species: Escherichia coli (C:Species: Escherichia coli (C:Date: 18-Jul-2001 *sequence_revision 18-Jul-2001 *text_change 02-Nov-2001 C:Accession: H91188 C:Accession: H91188 R:Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.; Han,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A:Molecule type: DNA
A:Residues: 1-1588 <STO>
A:Residues: 1-1588 <STO>
A:Cross-references: GB:AE005174; NID:g12518349; PIDN:AAG58749.1;
A:Experimental source: strain O157:H7, substrain EDL933
C:GenetLcs:
A:Gene: Z5029
                                                                                                    A; Experimental source: strain C; Genetics: A; Gene: ECs4480
                                                                                                                                                                                                                                                             gasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shi
DNA Res. 8, 11-22, 2001
A;Title: Complete genome sequence of enterohemorrhagic Escherichia
A;Reference number: A99629; MUID:21156231; PMID:11258796
                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
H91188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       БР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                       A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                            A; Accession: H91188
                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1344 NGIG------DIVTTGSTKYFKTNTDGVDASAQGKDSVAIGSGSIAAADNSVALGTGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         195 TLTDXLXXXXAXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKXGXTXXXXXNVDFVX 254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            369 TATV-----SKDDQGNIT-VXYDVNVGDALNVNQLQNS---GWNLDSKAVAGSSGKVI 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         255 TYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKLVTGKXKXENXSSTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    149 VXTEKLSFXANXXKVNIXSDTKGL----GS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STNSQGEYSAALGAGIQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                XXALNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQ-------NLNNXIDNV 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VATEENTISVGSSTNORRITNVAAGKNATDAVNVAQLKSSEAGGVRYDTKA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            XGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV-----TFASGXGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QITNVAAGSADTDAVNVG-----QLKVTDAQVSQNTQSITNLDNRVTNLDSRVTN---IE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VGTDSLAMGAK----TIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAIGNGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVALGVSMVSANGRWVYKLQG 1570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDX 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     XGNARAGIAQAIATAGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTA
  120;
                       Similarity
                                                                                                                                                                                                                                                                                                                       Makino, K.; Ohnishi,
Vasunaga, T.; Kuhara,
    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -RISNVSAGVNNNDVVNYAQLKQSVQETKQYTDQRMVEMDNKLSKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12.0%;
24.1%;
                    12.0%;
24.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              48;
  48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 299.5; DB 2;
Pred. No. 3.7e-13;
8; Mismatches 177;
Score 299.5; DB 2;
Pred. No. 3.7e-13;
8; Mismatches 177;
                                                                                                                                                                                                                                                                                                                          S ::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -RGAQTN---YTAYNMDAPQNSVGEFSVGSADGQR 1291
                                                                                                                                                                                                                                                                                                                          Kurokawa, F
Shiba, T.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----YSNITLGGGNGGTT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1588;
                                         1588;
  153;
                                                                                                                                                                                                                                                                                                                     ; Yokoyama,
Shinagawa,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GSPDB:GN00145;
                                                                                                                                                                                                                                                                                      coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1465
                                                                                                                                                                                                                                                                                      O157:H7
                                                                                                                                                                                                                                                                                                                          # X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              16;
  16;
                                                                                                                                                                                                                                                                                      and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UWGP: Z5
                                                                                                                                                                                                                                                                                    gen
                                                                                                                                                                                                                                                                                                                                                 C
                                                                                                                                                                                                                                                                                                                                                                                                                                RIM
```

9

```
R;Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M. deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G. I., M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barrel Nature 413, 523-527, 2001

Nature 413, 523-527, 2001

A;Title: Genome sequence of Yersinia pestis, the causative agent of plague.

A;Reference number: AB0001; MUID:21470413; PMID:11586360
                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                             A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-658 <KUR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Species: Yersinia pestis
C;Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ·δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                    Š
                                                               DЬ
                                                                                                                                                Вþ
                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Accession: AH0110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C; Accession: AH0110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                probable surface protein (partial) YPQ0902 [imported] - Yersinia pestis (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AH0110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                           Cross-references: GB:AL590842; PIDN:CAC89747.1; PID:g15978974; GSPDB:GN00175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    195
                                                                                                                                                                                           235 IKGVKXGXTXXXXXNVDFVXT----YDTVEFLSADTKTTTV--NVESKDNGKXTEV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QITNVAAGSADTDAVNVG-----QLKVTDAQVSQNTQSITNLDNRVTNLDSRVTN---IE 1343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NGIG-----DIVTTGSTKYFKTNTDGVDASAQGKDSVAIGSGSIAAADNSVALGTGS
                    KTTTANGQ-----TGQADKFETVTSGTXVTFASGXGTTATVSKDDQGNITVXYDVNVGDA
                                                               ANSTQPDSVASGTNSVAIGPASLASGNAALASGAGAVAIGDGAAASADGSVAIGQG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STNSQGEYSAALGAGIQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVALGVSMVSANGRWVYKLQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      XGNARAGIAQAIATAGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDX 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VATEENTISVGSSTNQRRITNVAAGKNATDAVNVAQLKSSEAGGVRYDTKA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         XGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV-----TFASGXGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKLVTGKXKXENXSSTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TLTDXLXXXXAXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKXGXTXXXXXXVVDFVX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VGTDSLAMGAK----TIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAIGNGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VXTEKLSFXANXXKVNIXSDTKGL----
                                                                                                   -----KIGAKTSVIKEKDGKLVTGKXK-XENXSSTDXGEGLVTAKEVIDAVNKAGWRM 336
                                                                                                                                                {\tt ITGVAAGSASSDAVNVAQLTAVGDQVQQNTANITSLGGRVTTIEGSMASIANGGGVKYFH}
                                                                                                                                                                                                                                        103;
=
                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -SKDDQGNIT-VXYDVNVGDALNVNQLQNS---GWNLDSKAVAGSSGKVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -RISNVSAGVNNNDVVNYAQLKQSVQETKQYTDQRMVEMDNKLSKT
                                                                                                                                                                                                                                                            11.5%;
24.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     604
                                                                                                                                                                                                                                        57;
                                                                                                                                                                                                                                   Score 287.5; DB 2;
Pred. No. 9.4e-13;
7; Mismatches 185;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RGAQTN --- YTAYNMDAPQNSVGEFSVGSADGQR 1291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -NFAKXTAXTNGDXTVHLNGI----GS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ---YSNITLGGGNGGTT----
                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                        71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1395
                        391
                                                                                                                                                    327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        194
                                                                                                                                                                                                                                        13;
```

```
In, T.; Commune, S.; O'Gaora, P.
, S.; Moule, S.; O'Gaora, P.
Nature 413, 848-852, 2001
A;Authors: Parry, C.; Quail, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.
A;Authors: Parry, C.; Quail, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.
A;Title: Complete genome sequence of a multiple drug resistant Salmonella enterica serce number: AB0502; PMID:11677608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         probable autotransporter sapB [imported] - Salmonella enterica subsp. enterica serovar C;Species: Salmonella enterica subsp. enterica serovar Typhi A;Note: this species has also been called Salmonella typhi C;Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change 09-Nov-2001 C;Accession: ACO976
                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                      Db
                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                   Š
                                                                                   망
                                                                                                                         Š
                                                                                                                                                                   В
                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Cross-references: GB:AL513382;
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Reference number: AB0502;
A; Accession: AC0976
A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R; Parkhill, J.; Dougan, G.; Jan
th. T.; Connerton, P.; Cronin,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Molecule type: DNA
A; Residues: 1-1107 < PAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 102
1065
                                                                                                                                                                     950
                                                                                                                                                                                                               453
                                                                                                                                                                                                                                                                                                 406
                                                                                                                                                                                                                                                                                                                                                                                   368
                                                                                                                                                                                                                                                                                                                                                                                                                             773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                713
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SADTKTTTVNVESKDNGKXTEVK-----IGAKTSVIKEK-DGKLVTGKXKXENXSSTDX 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SGSSMTTIGAASYRGQSALSLGVSSISDSGRWVSKLQASSNTQGDFGIGVGVGVQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   I--ATSMXPQFSSVSLGAGADAPTLS-----VDXXXALNVGSKXXNKPVRITNVAP
NGESAVAIGVSMVSESGGWVYKLQGTSNSQGDYSAAIGAGFQW
                                     XGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASVGYQW
                                                                                                                                                                     QLKASEAGSVRYETNADG---SVN-YSVLNLGD-GSGGTTRIGNVSAAVNDTDAVNYAQL
                                                                                                                                                                                                                                                     GADSVAIGSGSIAAAENSVALGTNSVADEANTVSVGSSTQQRRITNVAAGVNNTDAVNVA
                                                                                                                                                                                                                                                                                                                                         LKVTDAQVSRNTQSITNLNTQVSNLDTRVTNIENGIGDIVTTGSTKYFKTNTDGADANAQ
                                                                                                                                                                                                                                                                                                                                                                                                                          GNGSQTTRGA--QTDYTAYNMDTPQNSVGEFSVGSEDGQR-QITNVAAGSADTDAVNVGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GEGLVTAKEVIDAVNKAGWRMKTT-----TANGQTGQADKFETVTSGTXVTFASGXG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STEEDSLAVGTDSLAMGAKTIVNADAGIGIGLNTLVMADAINGIAIGSNARANHANSIAM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATQGTDAVNFDQLKSISNQTNAYTNQRYSELKQDLRKQNSVLSAGIASAMSMASLTQPYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GVKEGDVTNVAQLKGVAQNLNNXIDNVXGNAR------AGIAQAIATAGLXQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGGAGSVASGNNSTAFGSGAKATAANSAALGANSVADRANSVSVGSVGNER---QITNVAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EIXRNGKNID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --SGDNGRGVENYIGKYSNASNTSSGTVSVGNTATGETRTVSNVADG-----LQATDA 434
                                                                                 KRSVEEANTYTDQKMGEMNSKIKGIENKMSGGIASAMAMAGLPQAYAPGANMTSIAGGTF
                                                                                                                                                                                                             TSMXPQFSSVSLGAGADAPTLSVDXXXALNVGSKXXNKPVRITNVAPGVKEGDVTNVAQL 512
                                                                                                                                                                                                                                                                                               -SKAVAGSSGKVISGNVSPSKGK---MDETVNINAGNNIEIXR-----NGKNIDIA 452
                                                                                                                                                                                                                                                                                                                                                                                   -TTATVSKDDQGNITVXYDVN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; James,
nin, A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IAASIVVVENNVSGLQNGTDGMFQVNNSSGLAKPSATGANSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PIDN:CAD03303.1; PID:g16504923; GSPDB:GN00176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 278.5; DB 2; Pred. No. 7.3e-12;
                                                                                                       -----GIAQAIATAGLXQAYLPGKSMMAIGGXTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             K.D.; Thomson, N.R.; Pickard, D.; '
Davis, P.; Davies, R.M.; Dowd, L.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                ---VGDALNVNQLQNSGWNLD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  176;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Wain, J.; White,
                                                                                                                         561
                                                                                                                                                                                                                                                                                                                                         889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                499
                                                                                                                                                                   1004
                                                                                                                                                                                                                                                       949
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            484
                                                                                                                                                                                                                                                                                                                                                                                   405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 J.; Churcher
e, N.; Farrar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14;
```

```
A, Experimental Source: Strain 9a5c
A, Experimental Source: Strain 9a5c
Rr Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.
Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer
as Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr
J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; La
chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marxino, C.L.; Marques, M.V.; Martino
A; Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.
F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; palmieri,
Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa
A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silv
M.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.
A; Reference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                      Qy
                                                                                                                                                                                                                                                            ρy
                                                                                                                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Contents: annotation C;Genetics: A;Gene: XF1516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Title: The genome sequence of the plant pathogen Xylella fastidiosa. A; Reference number: A82515; MUID: 20365717
A; Note: for a complete list of authors see reference number A59328 bel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   surface-exposed outer membrane protein C;Species: Xylella fastidiosa C;Date: 18 Aug-2000 #sequence_revision C;Accession: C82672
밁
                                          Ωy
                                                                                                      В
                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Cross-references: GB:AE003981; GB:AE003849; NID:g9106543; PIDN:AAF84325.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: DNA
A; Residues: 1-1004 <SIM>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Accession: C82672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R; anonymous, The Xylella fastidiosa Consortium of the Organization Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best
                                                                                                         414
                                                                                                                                                                                                                  354
                                                                                                                                                                                                                                                                                                                           309
                                                                                                                                                                                                                                                                                                                                                                                 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         139
                                                                                                                                                                                                                                                                     488
                                                                                                                                                                                                                                                                                                                                                                                                                                       249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               274 ESKDNGKXTEVKIGAKTSVIKEKDGKLVTGKXKXE-NXSSTDXGEGLV--TAKEVI---- 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QSANNG----VALGSNSTVSGVNSVALGAGSMASELNVISVGGGDGVTGPAVRRIVNVGD
                                                -SGNSRGH---FGXSASVG
                                                                                                      QDSTAAGASAQAAGDSSIALGARSRANAIGSSALGVDGHALGANSTALGG-----QSTAIS
                                                                                                                                                            AIATAGLXQAYLPGKSMMAIG-----
                                                                                                                                                                                                                  LRGPAVRRIVNVGDGIGNNDAVNKSQLDGVTASVNDVVASVKNIAGAIQITGSGVASVSG
                                                                                                                                                                                                                                                                  XNKPV--RITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNV-----
                                                                                                                                                                                                                                                                                                                              GEGSFNGLALGSNSLVLLQGVD
                                                                                                                                                                                                                                                                                                                                                                           G----NNIEIXRNG----KNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXALNVGS-KX 487
                                                                                                                                                                                                                                                                                                                                                                                                                                    GAQAVADNTVAFGGRAIANAVGASALGFDSHAKGINSTTVGTQSVSLGQGGVSLGYNSFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINA 436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GIGNNDAVNKSQLDGVTASVN----DVAASVKTIALTNQVTGSSVASASGKESTAIGS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----DAVNKAGWRMKTTTANGQTGQADKFETV----TSGTXVTFASGXGTTATVSKDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         osed outer membrane protein XF1516 [imported] - Xylella Xylella fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6.9%;
25.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No. 0.00017;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20-Aug-2000 #text_change 20-Aug-2000
                                                                                                                                                         -GXTYXGEAGYAIGYSSISXXGNWXIKGTA--
                                                                                                                                                                                                                                                                                                                              SVALGSGSMASEPNV----VSVGSGDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1004;
                                                                                                                                                                                                                                                                     XGNARAGIAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                           469
                                                                                                                                                                                                                  413
                                                                                                                                                                                                                                                                        536
                                                                                                                                                                                                                                                                                                                                                                                                                                       308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            194
                                                                                                                                                                                                                                                                                                                              353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSPDB:GN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (strain
```

AB3486

cell surface

protein [imported] - Brucella melitensis (strain 16M)

```
A;Gene:
A;Map po
                                                                                                                                                                                                                                                                                                                                                       sapB protein - Campylobacter fetus
C:Species: Campylobacter fetus
C:Date: 16-Aug-1996 #sequence_revision 16-Aug-1996 #text_change 08-Oct-1999
C:Accession: I40711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; Mazur, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, Sproc. Natl. Acad. Sci. U.S.A. 99, 443-448, 2002
A;Title: The genome sequence of the facultative intracellular A; Reference number: AD3252; PMID:11756688
A; Accession: AB3486
                                                                                                                                                                                                                                                          R;Dworkin, J.; Tummuru, M.K.; Blaser, M.J.
J. Biol. Chem. 270, 15093-15101, 1995
A;Title: Segmental conservation of sapA sequences in A;Reference number: A56999; MUID:95318069
A;Accession: I40711
                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
140711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C; Accession: AB3486 R; DelVecchio, V.G.; Kapatral,
                 Q
                                                                                                                                                                                                      A; Molecule type: DNA
A; Residues: 1-936 < RES>
                                                                                                                                                                                                                                       A; Status: preliminary; translated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                  A;Gene: sapB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: GB:AE008917; PIDN:AAL53053.1; PID:g17983913; GSPDB:GN00190 A;Experimental source: strain 16M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: DNA
A; Residues: 1-365 < KUR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Experimental source: strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Ma
Best Loc
Matches
                                                                                                                                                                                   ;Cross-references: EMBL:U25133; NID:g801999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Species: Brucella melitensis; Date: 01-Feb-2002 #text_change 01-Feb-2002; Date: 01-Feb-2002 #sequence_revision 01-Feb-2002 #text_change 01-Feb-2002
                                                                       Query Match
Best Local :
                                                                                                                                                                  Genetics:
                                                                                                                                                                                                                                                                                                                                                     Accession: I40711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Genetics:
                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      position:
                     159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 375 DDQGNIT-VXYDVNVGDALNÝNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVN 433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 261 TALQTLDQANAYTDKKFGKLNEDIVATRIEARQAAAIGLAAASLRYDDRPGKISAAIGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                141
                                                      Local Similarity hes 93; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity hes 72; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29
                                                                                                                                                                                                                                                                                                                                                                                                                                                     12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BMEI1872
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FWRGEGAVALGLGHTSEDQRMRSNLSAATSGGNWSM
                   NXXKVNIXSDTKGLNFAKXTAXTNGDXTVH---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ISVGNGAQASAHGSVALGENAAAPDANSVALGAGSKTSEVVATKGTTINGQYYDFAGDAP 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENLANINDILHDIESGGGIKYFHANSIG--ADSRALGINSIAVGSDSVASGEG-----S 80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DRHSDGTKKNSMTLQGWDSATPVVLANVADGVHKNDAVNVSQLKAGLSTTLGEAKAYTDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----VGSKXXN------KPVRITNVAPGVKEGDVTNVAQLK------GVAQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGTVSVGDKGAERTITNVAAGRISVESTDAVNGSQLNAVNQAIENLAAGVTENDKFSVKY
 Conservative
                                                       Conservative
                                                                         5.9%;
21.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -NLNNXIDNVXGNARAGIAQAIATAGLXQAYLPGKSMMAIGGX 559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----YSSISXXGNWXI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            V.; Redkar,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --LSVDXXXALN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            37;
                                                      47;
                                              Score 146.5; DB 2;
Pred. No. 0.012;
""smatches 166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 154; DB 2;
Pred. No. 0.0012;
7; Mismatches 91
                                                                                                                                                                                                                                             from
                                                                                                                                                                                                                                             GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R.J.; Patra,
                                                                                                                                                                                   PIDN:AAA79683.1; PID:g802000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              582
--LNGIGSTLTDXLXXXXAXXXX 209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            91;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 365
                                                                                                                                                                                                                                                                                                 type B Campylobacter fetus cells.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       G.; Mujer, C.; Los, T.;
agius, S.; O'Callaghan,
                                                      Indels 133;
                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels 136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----DAP 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      pathogen Brucella meliter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            T.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10;
                                                      18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ivanova
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Letes
```

9

```
adnesin/invasin, probable NMB1994 [imported] - Neisseria meningitidis (strain C;Species: Neisseria meningitidis C;Date: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001 C;Accession: A81019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R:Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; ri, H.; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Science 287, 1809-1815, 2000
A; A; Authbors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; A; Title: Complete genome sequence of Neisseria meningitidis serogroup B A; Reference number: A81000; MUID:20175755
A; Accession: A81019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT
A81019
Вþ
                                                                        B
                                                                                                          δÃ
                                                                                                                                                   Вp
                                                                                                                                                                                     Š
                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Molecule type: DNA
A; Residues: 1-364 <TET>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Cross-references: GB:AE002548;
A;Experimental source: serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                       ;Genetics:
                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                   397
                                                                        150
                                                                                                              337
                                                                                                                                                   104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           273
170
                                                                                                                                                                                       277
                                                                                                                                                                                                                                                                 230 NAGWNIKGVKXGXTXXXXXNVDFVXTYD-TVEFLSAD-----
                                                                                                                                                                                                                              45
                                                                                                                                                                                 DNGKXTEVKIGAKTSVIKEKDGKLVTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRM 336
                                                                                                                                                                                                                              NNGQEINGFKAGETIYDIGEDGTITQKDATAADVEADDFKGLGLKKVVTNLTKTVN-ENK 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GNARAGIAQAIATAGLXQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STLNLINSSVNGHNISTAAKDVTVHLSGSAAKVKLNTTAAT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DALNVNQLQNSGWNLDSKA-----VAGSSGKVISGNVSPSKGKMDETVNINAG---NNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GVAAVTSATAVEN-----LTVKHATNVTLAGNMDKLATVTLDNAA-LTAAIDIKSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NKAGWRMKTTTANGQTGQADKFETVTSGTXVTFASGXGTTATVSKDDQGNITVXYDVNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TVNVESKONGKXTEVKIGAKTSVIKEKDGKLVTGKXKXENXSSTDXGEGLVTAKEVIDAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITAFTAAGTGKV----DV-----VAGKITALTADSATSVNLTATNDTITLTSANAATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NVENINIISDLE-----TSGDFVFNGYEKVGFNVLGDIASFATDASKSVNVETTG
LEAVADTVDKHAEAFND---IADSLDETNTKADEAVKTANEAKQTAEETKQNVDAKVKA-
                                 LQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMX 456
                                                                                                                                                 QN---VDAKVKAAESEIEK-----LTTKLADTDAALADTDAAL----DETTNALNKLG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     XXALNVGSKXXNKPVRITNVAPGVKEGDVTNVA-----QLKGVAQNLNN-----XIDNVX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EFDSGTAKTTSVTASGSGKTLVIKGAEVETLVNIDTTAFNGAADVSFGKDAQSGKFSV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   XXXXXXXXXXRAASXKDVLNAGWNIKGVKXGXTXXXXXNVDFVXTYDTVEFLSADTKTT
                                                                                                            KTTTANGQTGQADKFETVTSGTXVTFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQ 396
                                                                                                                                                                                                                                                                                                       91;
                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----KTGTGDDKIEFVGTTLTEGSVIDGAGNDTIAMKSAALTSANFTMIKNIENV-
                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----XRNGKN------IDIATSMXPQFSSVSLGAGADAPTLSVDX
                                                                        ---ENIT----TFAE--ETKTNIVKIDE--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -VNLKTS-----TIDAT
                                                                                                                                                                                                                                                                                                                         5.7%;
22.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            546
                                                                                                                                                                                                                                                                                                       48;
                                                                                                                                                                                                                                                                                                                                                                                                                                     GB:AE002098; NID:g7227249; B, strain MC58
                                                                                                                                                                                                                                                                                                                         Score 142.5; DB Pred. No. 0.0076;
                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                         157;
                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DQTVTLKANATDNSL
                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                   ---TKTTTVNVESK 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                            PIDN:AAF42321.1; PID:g722
                                                                                                                                                                                                                                                                                                         103;
                                                                        ----К 169
                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                   149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              K.E.; Eisen,
Dougherty, B.; Pizza, M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Rappuoli, R.;
strain MC58.
                                                                                                                                                                                                                                                                                                         20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MC58
```

```
R:Zhao, J.; Orser, C.S.
Mol. Gen. Genet. 223, 163-166, 1990
Mol. Gen. Genet. 223, 163-166, 1990
A:Title: Conserved repetition in the ice nucleation gene inaX from Xantho
A;Reference number: S11672; MUID:91080859
A;Accession: S11672
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-1567 <ZHA>
A;Residues: 1-1567 <ZHA>
A;Cross-references: EMBL:X52970; NID:g48531; PIDN:CAA37140.1; PID:g48532
C;Superfamily: ice nucleation protein
                                  RESULT
E97835
                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                              рь
                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ice nucleation protein - Xanthomonas campestris
C:Species: Xanthomonas campestris
C:Date: 21-Nov-1993 #sequence_revision 10-Nov-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
S11672
                                                                                                        밁
                                                                                                                                     Ş
                                                                                                                                                                       밁
                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C; Accession: S11672
R; Zhao, J.; Orser,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QY
hypothetical protein rompB [imported] - C; Species: Rickettsia conorii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ice nucleation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                1068
                                                                                                                                                                                                                                             1126
                                                                                                        1234
                                                                                                                                                                                                                                                                                                                                                                                  1014
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        516
                                                                                                                                                                                                                                                                               475
                                                                                                                                                                                                                                                                                                                                                                                                                                                       968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       911 ---GSTGTAGADSTLIAGYGSTQTSGSDSSLTAGYGSTQTARKGSDMTAGYGSTGTAGAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              865
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              457
                                                    15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AGYGSTQTAGSDSSLTAGYGST-QTARQGSDITAGYGSTGTAGADSSLIAGYGS-TQTAG
                                                                                                                                                                                                                                                                                                                                                                                ADSTLIAGYGSTQTAGSD--SSLTAGY----GSTQTARQGSDVTAGYGSTGTAGADSTLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKLVTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VKXGXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TGTAGADSTL-ISGYGSTQT-----AGSDSSLTAGYGSTQTARKGSDVTAGY----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TGFRFTENFAAKAGVAVGTSSGSSAAYHVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AQ--NLNNXIDNVXGNARAGIAQAIATAGLXQAYLPGKSMM--AIGGXTYXGEAGYAIGY
                                                                                                    STAGHESSLIAGYGSTQIAGYE
                                                                                                                                      NSRGH-----FGXSASVGYQ
                                                                                                                                                                                                                                         YDSNLTAGYGSTQTAR-----EDSSLTAGYGSTSTAGHDSSLIAGYGSTQTAGY
                                                                                                                                                                                                                                                                            VDXXXALNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGI 534
                                                                                                                                                                                                                                                                                                                                            SGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDI---ATSMXPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                                                                                                                                                                                                                                 TXVTFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVI 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                       STLIAGYGSTQTSGS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SSISXXGNWXIK-----GTASGNSRG-HFGXSASVGYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PQFSSVSLGAGADAPTLSVDXXXALNVGSKXXNKPVRTTNVAPGVKEGDVTNVAQL-KGV
                                                                                                                                                                     -NSILTTGYGSTQTAQESSSLTAGYGSTSTAGYDSTLTAGYGSTQTAGYKSTLTAGYGSN
                                                                                                                                                                                                       AQAIATAGLXQAYLPGKSMMAIGGXTYXGEAGY----AIGYSSISXXG--NWXIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----AETAAGKAEAAAGTANTAADKAEAVAAKVTDIKADIATNKADIAKNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5.7%; Score 142.5; D
19.2%; Pred. No. 0.04;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                   -DSSLTAGYGSTQTAREGSDVTAGYGSTGTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10-Nov-1995
                Rickettsia conorii (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----VNYEW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              235;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1567;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            26-Aug-1999
                 Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Xanthomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                474
                                                                                                                                                                                                                                                                                                                                                                               1067
                                                                                                                                                                                                       588
                                                                                                                                                                                                                                                                                                              1125
                                                                                                                                                                                                                                                                                                                                                                                                                                                   1013
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          campestr
```

```
C;Date: 30-Sep-2001 #sequence_revision 30-Sep-2001 #text_change 30-Sep-2001 C;Accession: E97835
R;Ogata, H.; Audic, S.; Renesto-Audiffren, P.; Fournier, P.E.; Barbe, V.; Samsc Science 293, 2093-2098, 2001
A;Title: Mechanisms of Evolution in Rickettsia conorii and Rickettsia prowazeki A;Reference number: A97700; MUID:21442074; PMID:11557893
A;Accession: E97835
A;Scatus: E97815
A;Residues: Preliminary
A;Molecule type: DNA
A;Residues: 1-1655 <KUR>
A;Cross-references: GB:AE006914; PIDN:AAL03623.1; PID:g15620207; GSPDB:GN00173
C;GenetLcs:
A;Gene: rompB
                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                             Qy
                                                                          Ъ
                                                                                                            Q
                                                                                                                                                    밁
                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
밁
                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                501
                                                                                                                                                      665
                                                                                                                                                                                            450
                                                                                                                                                                                                                                                                                                            547
                                                                                                                                                                                                                                                                                                                                                                                         490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         249
774
                                                                                                                                                                                                                                                                                                                                                                                     LADGTVINGKVNQTALVGGALAAGTITLDGSATITGDIGNAG---GAAALQGITLANDAT 546
                                                                                                                                                      TRTTNAAGQGKIIFNPVVNNNTTLATGTNLGS-ATNPLAEINFGSKGAANVDTVLNVGKG
                                                                                                                                                                                          DIATSMXPQ----FSSV-----SLGAGADAPTLSVDXXXALNVGSKXXNKPVRITNVAPG
                                                                                                                                                                                                                                NAQTLTINGKIGTVGANNKTLGQFNIGSSKTVLSDGDVAINELVIGNNGAVQFAHNTYLI
                                                                                                                                                                                                                                                                    QLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM-DETVNIN---AGNN--IEIXRNGKNI
                                                                                                                                                                                                                                                                                                                                                   ETVT-----
                                                                                                                                                                                                                                                                                                                                                                                                                           EKDGKLYTGKXKXENXSSTDXGEGLVT---AKEVIDAVNKAGWRMKTTTANGQTGQADKF 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NTAGVITFDANGTLASASADANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSVFK 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NVDFVXTYD----TVEFLSADTKTTTVN----VESKDNG------KXTEVKIGAKTSVIK 294
VKFLGNATFNGNTTIAAN-STLQIGGNYTADFVASADGTG
                                    MMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRG
                                                                                                                VKEGDVTNVAQLKGVAQNLNNXIDNVXG-NARAGIAQAIATAGLXQ------AYLPGKS
                                                                                                                                                                                                                                                                                                            KTLTLGGANIIGANGGTINFQANGGTIKLTS--TQNNIVVDFDLAIATDQTGVVDASSLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                               -SGTXVTFASGXGTTATVSKDDQGNITVXYDV-----NVGDALNVN 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5.7%; Score 142.5; DB 23.5%; Pred. No. 0.043;
                                                                            -NVGSFIFNAGGTNIVSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                          ---TVGGQQGNKFNTVALDNGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               183;
  812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2;
                                      592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    prowazekii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    V.; Samson,
                                                                                                                                                                                                                                                                      449
                                                                                                                552
                                                                                                                                                      723
                                                                                                                                                                                                                                  664
                                                                            773
                                                                                                                                                                                          500
                                                                                                                                                                                                                                                                                                            604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20;
```

Search completed: July 3, 2002, 08:12:36 Job time: 458 sec

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Run
                                                                                                                                                                                                                                                                                                                                                                                                Database
                                                                                                                                                                                                                                                                                                                                                                                                               Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Total number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein -
  9
10
11
12
13
13
14
16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   on:
                                                                                                                                                                                                    and is derived
                                                                                                                                                                                                                       Pred. No.
 2241
2239.5
2239.5
2235
2235
2231.5
2231.5
2230.5
2230.5
2230.5
2238
                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB DB
                                                                                                                                                                                                                                                                                                                                                                                               ..
                                                                                                                                                         Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                   seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of
                                                                                                                                                                                                     derived
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                   length:
                                                                                                                                                                                                                                                                                                                                                 spTREMBL_19:*
1: sp_archea:*
2: sp_bacteria
3: sp_fungi:*
4: sp_human:*
5: sp_inverteb
                                                                                                                                                                                                  is the number of results predicted by chance to have a ater than or equal to the score of the result being printed, rived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             hits satisfying chosen parameters:
                                                                                                                                                                                                                                        9:
10:
11:
12:
13:
14:
15:
                                                                                                                                                         Match
  US-09-771-382-11
2499
1 MNXIXRIIWNSALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                562222 segs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  July
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version 4.5
Copyright (c) 1993 - 2000 Com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MNXIXRIIWNSALNAWVXVS.....TASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                              sp_phage:*
                                                                                                                                                                                                                                                                                                                        sp_organelle:*
                                                                                                                                                                                                                                                                                                                                         sp_mammal:*
                                                                                                                                                                                                                                                                                                                                                   sp_invertebrate: *
                                                                                                                                                                                                                                                                                                                                                                           sp_bacteria:*
                                                                                                                                                                                                                                                                                                                                                                                      sp_archea:*
                                                                                                                                                                                                                                                                                                                                sp_mhc:*
                                                                                                                                                                                                                                      sp_archeap:*
                                                                                                                                                                                                                                               sp_bacteriap:*
                                                                                                                                                                                                                                                       sp_unclassified:*
sp_rvirus:*
                                                                                                                                                                                                                                                                           sp_vertebrate:*
                                                                                                                                                                                                                                                                                    sp_virus:*
                                                                                                                                                                                                                                                                                            sp_rodent:*
                                                                                                                                                                                                                                                                                                    sp_plant:*
                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                    2000000000
  2002, 08:28:47 ;
                                                                                                                                                        DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 172994929 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapext 0.5
   Q9JPS7
Q93QY3
5 Q9JR18
Q9JQY4
Q9JPI3
Q9JPS2
                                                     Q9JPR7
Q9JPS3
Q9JPS3
Q9JPS3
Q9JQY5
Q9JPT0
Q9JPS0
Q9JPR8
Q9JPR8
                                                                                                                                                                                   SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Search time 168.02 Seconds (without alignments) 621.884 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               562222
O9jpr7 neisseria m
O9jps8 neisseria m
O9jps8 neisseria m
O9jps3 neisseria m
O9jpt0 neisseria m
O9jpt0 neisseria m
O9jps0 neisseria m
O9jpr8 neisseria m
O9jr18 neisseria m
O9jr18 neisseria m
O9jr18 neisseria m
O9jpr3 neisseria m
                                                                                                                                                       Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            604
```

Q46037 campylobact	Q46037	N	936	5.9	146.5	5
Q9kka9 rickettsia	Q9KKA9	N	1616		147	4
Q9kka1 rickettsia	Q9KKA1	N	1616		148	ω
Q9kka2 rickettsia	Q9KKA2	N	1616	5.9	148	2
Q9fda0 xanthomonas	Q9FDA0	N	1265		148	Ξ
Q93ty6 staphylococ	Q93TY6	N	2276		150	0
Q9lax0 xanthomonas	Q9LAX0	N	1328	•	152.5	39
Q915c3 lactobacill	o	ν	458		154.5	8
Q98e20 rhizobium l		16	3930	6.8	169	37
Q9pd63 xylella fas		16	1004	6.9	173	8
Q92kq7 rhizobium m		16	1291	7.3	182	Š
		16	1953	•	192.5	4
Q9f3x5 pasteurella		16	2712	10.2	256	ü
	o	N	1107	11.1	278.5	ະ
		16	1299	12.7	318.5	Ξ
Q9pd50 xylella fas		16	2059	12.8	319	õ
		16	1190	13.0	326	9
	_	N	1098	٠	880	8
P71401 haemophilus		2	2353	36.7	917.5	27
_	_	N	530	•	2021.5	6
_	Q9JPS4	N	526	81.4	2033.5	3
Q9jps6 neisseria m	_	N	600		2201	4
Q9jps9 neisseria m	_	N	592	88.6	2215	Ω
Q93qy2 neisseria m	_	N	592	٠	2216	2
Q9aqfO neisseria m	0	N	592	8	2216	ב
Q9jqw4 neisseria m	-	16	592	88.9	2221	õ
Q9jph7 neisseria m		N	594	9.	$\sim$	9
Q9jphO neisseria m		ผ	595	9	٠.	8
Q9jpr9 neisseria m	Q9JPR9	N	598	89.0	2225	7

## ALIGNMENTS

```
RESULT
Q9JPR7
οy
                                                                              В
                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                            ACCOCK AC
                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 469; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-SWZ107;

MEDLINE-20175756; PubMed-10710308;

MEDLINE-20175756; PubMed-10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          O9JPR7;
01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-MAR-2001 (TrEMBLrel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                   Meningococcus by Whole-Genome
Science 287:1816-1820(2000)
EMBL; AF226385; AAR42534.1; -.
SEQUENCE 598 AA; 62431 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JPR7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=487;
    _
                                                                                                                                                            Н
                                                                                  MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQA---STTDDDDL
                                                                                                                       MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXX 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEMBRANE
                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROTEIN GNA992.
                                                                                                                                                                                                                                                                           89.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      beta
                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                      Score 2241; DB 2;
Pred. No. 7.7e-124;
0; Mismatches 129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      subdivision; Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                            0881CC094F33B4D4 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               598
                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                      6
                                                                                                                                                                                                                                      Gaps
                                                                                  57
                                                                                                                                                                                                                                          ω
--
```

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
Query Match
Best Local Similarity
Matches 468; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-2000 (Tri
01-OCT-2000 (Tri
01-MAR-2001 (Tri
0UTER MEMBRANE I
                                                                                                                                                                                                  MEDLINE-20175756; PubMed-10710308; Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi Comanducci M., Juzzi E., Manetti R., Marchetti E., Mora M., Nut Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo F Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H. Hood D.W., Jeffries A.C., Sannders N.J., Granoff D.M., Venter (
                                                                                                  Meningococcus by Whole-Genome Sequencing. Science 287:1816-1820(2000).
EMBL; AF26372; AAF45521.; -.
SEQUENCE 600 AA; 62606 MW; 13C35F1C46
                                                                                                                                                  Moxon E.R., Grandi G., Rappuoli R.;
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against
"Identification be whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9JPS5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9JPS5
                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDKGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               XXXXXXXXXXXXFTYSLKKXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TNGDTTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTDENTDENTNASSFTYSLKKDLTDLTSVETEKLSFGANGKKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (TremBLrel. 15, Created)
(TremBLrel. 15, Last seq
(TremBLrel. 16, Last ann
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                  N.A.
                               89.6%;
77.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                      beta
              0;
                               Score 2240;
Pred. No. 8.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                        subdivision;
                                                                                                    13C35F1C46392524
                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sequence update)
annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   600
                               DB 2;
3.9e-124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                                                                                                                                                                                                                                                                        Neisseriaceae;
                                                                                                                                                                      Serogroup
                                                                                                    CRC64;
                                               Length
              Indels
                                                                                                                                                                                                                             uapecchi B.
M., Nuti;
L., Zuo P.,
telin u
                                                 600;
                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria
              4;
                                                                                                                                                                                                         C
                                                                                                                                                                                                                                                            · s.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240
            2;
            PARSULT PARSUL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                         Q9JPS8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ب
```

```
Q9JPS8;
01-OCT-2000 (Tr)
01-OCT-2000 (Tr)
01-MAR-2001 (Tr)
0UTER MEMBRANE I
                            MEDLINE-20175756; PubMed-10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                           Bacteria; Proteobacteria; NCBI_TaxID=487;
Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                                                                              STRAIN=A22;
                                                                                                                                                                                                                                                             Neisseria meningitidis.
                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                            GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TFASGXGTTATVSKDDQGNITVXXDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TNGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DLEPVVRTAPVLSFHSDKEGTGEKEEVGASSNLTVYFDKNRVLKAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                              600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           604
                                                                                                                                                                                                                                                                                            (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 16, Last annotation updat
ANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                              PRELIMINARY;
                                                                                                                                                                                                                                              beta
                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                              subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                              599
                                                                                                                                                                                                                                                                                                           update)
                                                                                                                                                                                                                                                Neisseria
                                                                                           ₽.,
                                                                                                               s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58
```

u T

```
δ
                                                                                                                                                                                                                                                                     γ
                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                                      DЪ
                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δð
                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Ma
Best Loc
Matches
                                                                                                        Q9JPS3;
01-OCT-2000 (Tri
01-OCT-2000 (Tri
01-MAR-2001 (Tri
01-MAR-2001 (Tri
SEQUENCE FROM N.A.

STRAIN-NGE28;

MEDLINE-20175756; PubMed-10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi

Caleotti C.L., Luzzi E., Manetti R., Marschetti E., Mora M., Nut

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo F

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.
                                                                                                  GNA992
                                                                                                                                                 Q9JPS3
                                                                                  Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                         NCBI_TaxID=487;
                                                                                                                                                                                         596
                                                                                                                                                                                                        601
                                                                                                                                                                                                                        536
                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                        476
                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                       416
                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                        356
                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                       296
                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                      236
                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                       178
                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                      118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                                                                                                                        GYOW
                                                                                                                                                                                         GYOW
                                                                                                                                                                                                                                                      LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                     AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                             XXXXXXXXXXXXXXTYSLKKXLXXXXXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YLEPVKRTAVVLSFRSDKEGTGEKE-VTEDSHWGVYFDEKGVLKAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASV
                                                                                                                                                                                                                                                                                                                                                                                                                      TNGDTTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                     NTDENTDENTNASSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                         599
                                                                                                                                                                                                        604
                                                                                 Proteobacteria;
                                                                                          meningitidis
                                                                                                        0 (TrEMBLrel. 15, Cre
0 (TrEMBLrel. 15, Las
1 (TrEMBLrel. 16, Las
RANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              599
                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           89.6%;
                                                                                  beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ¥.
                                                                                                                Last sequence up
                                                                                                                                 Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score
Pred.
                                                                                  subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              46C2E974AF7F78E9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2239.5; DB 2
No. 9.5e-124;
                                                                                                                                                 590
                                                                                                                                                 ₿
                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     130;
                                                                                                                 update)
                                                                                  Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                  Neisseria
                  chi B.
Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5;
   Ξ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                 s:
                                                                                                                                                                                                                                                                       540
                                                                                                                                                                                                                                                                                       475
                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                       415
                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                     360
                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                      600
                                                                                                                                                                                                                                                       535
                                                                                                                                                                                                                                                                                                                                                      355
                                                                                                                                                                                                                                                                                                                                                                                      295
                                                                                                                                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                                                                                                                                                                     177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ω
••
```

```
밁
                                                                                                                                          δÃ
                                                                                                                                                             밁
                                                                                                                                                                         QΥ
                                                                                                                                                                                           Ъ
                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                             ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SO RET RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Ma
Best Loc
Matches
                                                         Q93QY5;
Q93QY5;
Q1-DEC-2001
Q1-DEC-2001
Q1-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Meningococcus by Whole-Genome Sequencing Science 287:1816-1820(2000).
EMBL; AF265978; AAR442527.1; -
SEQUENCE 590 AA; 61661 MW; 8AA476AC3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hood D.W., Jeffries A.C., Saunders N.J.,
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Aga
SEQUENCE FROM STRAIN=BZ10;
               NCBI_TaxID=487; [1]
                              Bacteria;
                                    Neisseria
                                                                                                                                                                                         467
                                                                                                                                              601
                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                       347
                                                                                                                                                                                                                                                                                                     301
                                                                                                                               587
                                                                                                                                                              527
                                                                                                                                                                            541
                                                                                                                                                                                                          481
                                                                                                                                                                                                                         407
                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                    287
                                                                                                                                                                                                                                                                                                                    229
                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                  169
                                                                                                                                                                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                59
                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                           ب
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Match
                                                                                                         S
                                                                                                                               GYQW
|||||
GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                            OUTER
                                                                                                                                                                                         VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                       TFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                               TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                     VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                            VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                               DLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                             VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                 01 (TrEMBLrel. 19, 00) (TrEMBLrel. 19, 01) (TrEMBLrel. 19, 10) 01 (TrEMBLANE PROTEIN.
                                                                                                                                              604
                                     meningitidis
                              Proteobacteria;
                                                                                                                               590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  89.48;
                              beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2235; DI Pred. No. 1.7e 0; Mismatches
                                                           Last
Last
                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0,
                                                                                          PRT;
                              subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8AA476AC300D80C8
                                                           sequence update) annotation updat
                                                                                          598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Against
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; DB 2;
1.7e-123;
                                                                                          β
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Granoff D.M.,
                              Neisseriaceae;
                                                           update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Venter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14;
                              Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                    346
                                                                                                                                                                                                                                                                                                                                                                                                              118
                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                                                             58
                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                            600
                                                                                                                                                                                                          540
                                                                                                                                                                                                                         466
                                                                                                                                                                                                                                                       406
                                                                                                                                                                                                                                                                                                     360
                                                                                                                                                                                                                                                                                                                    286
                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                  228
                                                                                                                                                                                                                                                                                                                                                                                168
                                                                                                                                                                                                                                                                                                                                                                                               180
```

ω

```
RESULT
Q9JPTO:
ID Q9
AC Q9
AC Q9
AC Q9
AC Q9
CO Q0
CO 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SORRARA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                      멂
                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Ma
Best Loc
Matches
                                                                                                                                                                               01-OCT-2000 (Tri
01-OCT-2000 (Tri
01-MAR-2001 (Tri
OUTER MEMBRANE I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennir "Identification and characterization of a gene encoding membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DBBJ databases.
EMBL; AF157603; AAK68864.1; -
SEQUENCE 598 AA; 62687 MW; 18CEFFE6410A15DF CRC64;
                                                                                                                                                                                                                                                              Q9JPTO;
                                                                                                                                                              GNA992
                STRAIN=2996;
MEDLINE=20175756;
                                                            SEQUENCE
                                                                                                NCBI_TaxID=487;
                                                                                                                       Bacteria;
                                                                                                                                       Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                        595
                                                                                                                                                                                                                                                                                                                                                                                                                           601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Match
Local Similarity
                                                                                                                                                                                                                                                                                                                           σ
                                                                                                                                                                                                                                                                                                                                                                                                             GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VTGKXKXENXSSTDXGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MNKISRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQA----NATDDDDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YLEPVQRTAVVLSFRSDKEGTGEKE-GTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                          FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                             604
                                                                                                                       Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                        598
                                                                                                                                                                                                  (TrEMBLrel. 15,
(TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                               PROTEIN GNA992.
                    PubMed=10710308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 89.4%;
                                                                                                                         beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2235; DI
Pred. No. 1.7e:
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                       Last
                                                                                                                                                                                                    Last sequence up
                                                                                                                                                                                                                                              Created)
                                                                                                                       subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2235;
No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; DB 2;
1.7e-123;
hes 129;
                                                                                                                                                                                                                                                                                     A
                                                                                                                         Neisseriaceae;
                                                                                                                                                                                                    update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Jennings
coding a r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                                                                                                                         Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         48C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ω
```

```
20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                           맒
                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                            Вp
                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).

EMBL; AR226359; AAF42508.1; -. SEQUENCE 598 AA; 62763 MW; 63A6A3BD7F0F2EE3 CRC64;
O9JPSO PRELIMINARY; PRT; 598 AA.

O9JPSO;
01-DCT-2000 (TrEMBLrel. 15, Created)
01-DCT-2000 (TrEMBLrel. 15, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
OUTER MEMBRANE PROTEIN GNA992 (NHHA OUTER MEMBRANE
GNA992 OR NHHA.

Neisseria meningitidis.
                                                                                                                                                                                                                                                             475
                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                             415
                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   117
                                                                                                                                                          595
                                                                                                                                                                                  601
                                                                                                                                                                                                           535
                                                                                                                                                                                                                                                                                                                                                               355
                                                                                                                                                                                                                                                                                                                                                                                                                295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Y Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GYQW
                                                                                                                                                                                                                                                         GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                         GYOW
                                                                                                                                                                                                        VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA
                                                                                                                                                                                                                                                                                                                         VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                               TFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                           TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                 VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKV
                                                                                                                                                                                                                                                                                                                                                                                                                            VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NTHENTHENTHOSSFTYSLKKOLTDLTSVETEKLSFGANGKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YLEPVQRTAVVLSFRSDKEGTGEKE-GTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        469;
                                                                                                                                                                                 604
                                                                                                                                                          598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        lato V., Masignani V., Giuliani M.M., Arico
Jennings G.T., Baldi L., Bartolini E., Cap
Luzzi E., Manetti R., Marchetti E., Mora M
ini L., Savino S., Scarselli M., Storni E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    89.4%;
77.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 2234; DB 2
Pred. No. 2e-123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                               PROTEIN).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      chi B.
Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      s;
                                                                                                                                                                                                                                                                                                               474
                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                               594
                                                                                                                                                                                                                                                                                                                                                                                                                  354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     294
```

```
DЪ
                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                 ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 дδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
 δô
                               B
                                                           QΥ
                                                                                                밁
                                                                                                                          Qy
                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AF1
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Peak I.R., Srikhanta Y., Dieckelman M., Moxon R "Identification and characterization of a gene membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ d EMBL; AF226381; AAF42530.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-NGH15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Prote
NCBI_TaxID=487;
   601
                                  535
                                                                541
                                                                                                475
                                                                                                                               481
                                                                                                                                                               415
                                                                                                                                                                                           421
                                                                                                                                                                                                                           355
                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                          295
                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                       237
                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                      177
                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match
   GYQW
                                                     AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                            LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                        GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                    XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                      GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                     TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YLEPVQRTAVVLSFRSDKEGTGEKE-GTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQA---NATDDDDL
                                 AGLAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGASASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    {	t NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         89.4%;
77.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           beta subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 2234; un
Pred. No. 2e-1;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        E6C7AEF0BB8A63CB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2e-123;
ches 129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Moxon R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               · .s
                                                                                                                                                                                           480
                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                            474
                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             57
                                                               600
                                                                                              534
                                                                                                                            540
                                                                                                                                                                                                                                                                                        354
                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                 594
                                                                                                                                                                                                                                                                                                                                                      294
                                                                                                                                                                                                                                                                                                                                                                                                                     236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            w
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT OPERATE OF THE PROPERTY OF THE PROPERTY
                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
              Š
                                              9
                                                                         δÃ
                                                                                                           В
                                                                                                                                    Q
                                                                                                                                                                         д
                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 118
                  601
                                              526
                                                                                                             466
                                                                                                                                             481
                                                                                                                                                                            406
                                                                                                                                                                                                        421
                                                                                                                                                                                                                                        346
                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                       286
                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                    168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              595
                                                                                                                                                                                                                                                                                                                                                                      226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               m
| | | | |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           469;
                  604
```

```
"Identification and characterization of a gene membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ (EMBL; AF157610; AAK68871.1; ". SEQUENCE 589 AA; 61448 Mm. """""
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q93QY1
Q93QY1;
01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=P20;
Peak I.R., S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                 TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                        VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                            GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                                                                                                                                                                                      ELESVARSALVLQFMIDKEGNGEIE-STGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNXIXRIIWNSALNAWYXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXXX
TFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                            VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKV
                                                                                                                                                                                                                                                              GSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                 TNGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKT
                                                                                                                                                                                                                                                                                                                                                                                 XXXXXXXXXXXXXFTYSLKKXLXXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (TrEMBLrel. (TrEMBLrel. (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                     -SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        89.3%;
77.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             19,
19,
19,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1F1A80CD610CB230 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        No. 2.7e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .7e-123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Jennings
coding a r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .
P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                outer
                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                     167
                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                                       465
                                                                                                                                                                                                                                     360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58
  585
                           600
                                                                            540
                                                                                                                                48C
                                                                                                                                                        405
                                                                                                                                                                                                            345
                                                                                                                                                                                                                                                                285
                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                  225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4.
```

뫄

586

GYOW

589

```
Ş
                                                                                                               밁
                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                    Ş
                                                       밁
                                                                                                                                     δÃ
                                                                                                                                                                       밁
                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                         뮹
                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                         δõ
밁
                        δÃ
                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q9JPR8;
Q9JPR8;
Q1-OCT-2000
Q1-OCT-2000
Q1-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B. Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecch Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., N Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuc Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings "Identification and characterization of a gene encoding a membrane protein of Nelsseria meningitidis.";
submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AFF26083; AAF42532.1;
EMBL; AFF27608; AAK68869.1;
EMBL; AFF37608; AAK68869.1;
SEQUENCE 599 AA; 62844 MW; BBA16EBF53C1970C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OUTER MEMBRANE PROTEIN GNA992 (NHHA GNA992 OR NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-NGH38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=487;
                                                                                                                                            241
 356
                            361
                                                       296
                                                                                    301
                                                                                                                                                                         178
                                                                                                                                                                                                      181
                                                                                                                                                                                                                                  118
                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                          59
                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                  1 MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXX 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9
                                                                                                                                  GXTXXXXXNVDFVXTYDTVEEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                       TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 420
                                                                       VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
 TFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                 GTT--ASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                          TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                 NTNKNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                              XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                      MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQA--NATDEDEEE
                                                           VTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                         ELEPVVRSALVLQFMIDKEGNGENE-STGNIGWSIYYDNHNTLHGATVTLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                            469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                        89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15,
15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   beta subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Last sequence update)
Last annotation update)
92 (NHHA OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Created)
                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                        Score 2231.5; DB 2; Pred. No. 2.8e-123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches 130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mora M., Nuti S
                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttelin H.,
Venter C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                          599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                в.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3
                                                                                                                                                                                                                                                                                                                                                                                                            5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ່ ໝ
                                                                                       360
                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                            117
                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                         240
                                                                                                                                                                                                                                     177
                                                                                                                    295
                                                                                                                                                                                                                                                                                                                                                                                                            ω
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
 밁
                     Ş
                                                В
                                                                    QY
                                                                                                밁
                                                                                                                       Ş
                                                                                                                                                В
                                                                                                                                                                     δÃ
                                                                                                                                                                                                В
                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9JPI0;
Q9JPI0;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                               Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., "Jentification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                         Meningococcus by Whole-Genome Sequencing. Science 287:1816-1820(2000).

EMBL; AF226384; AAF42533.1; -.

EMBL; AF226363; AAF42511.1; -.

EMBL; AF226363; AAF42512.1; -.

SEQUENCE 589 AA; 61520 MW; 2B2A95D486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-NGP165, 90/18311, AND 93/4286; MEDLINE-20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
 226
                                                  168
                                                                        181
                                                                                                                        121
                                                                                                                                                 59
                                                                                                                                                                        61
                                                                                                                                                                                              10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDKGA
GXTXXXXXVVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                  TNGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKT
                                                             XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                ELESVVRSALVLQFMIDKEGNGEIE-STGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ
                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                 Conservative
                                                                                                    -SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                            89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 beta subdivision;
                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                 Score 2230.5; DB 2
Pred. No. 3.1e-123;
0; Mismatches 120;
                                                                                                                                                                                                                                                                                                              2B2A95D4868566A6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   589
                                                                                                                                                                                                                                                   120;
                                                                                                                                                                                                                                                                          DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseriaceae;
                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria
                                                                                                                                                                                                                                                    15;
                                                                                                                                                                                                                                                                                                                                                                                                                                   P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ß
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540
                                                                                                    167
                                                                                                                                                     117
                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        600
     285
                            300
                                                    225
                                                                                                                                                                                                    58
```

4

```
В
                                                                                 δÃ
                                                                                                        Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
           δÃ
                              밁
                                             QΥ
                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     õ
                                                                                                                                              Query Match
Best Local s
Matches 469
                                                                                                                                                                                          A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.
B Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.
A Moxon E.R., Grandi G., Rappuoli R.,
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole Genome Sequencing.";
Cscience 287:1816-1820(2000).
R EMBL; AF220366; AAR42515.1;
-. Sequence 591 AA; 62113 MW; 533453CAE5A91E1F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                 09JBS7;
01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis
Bacteria; Proteobacter
                                                                                                                                                                                                                                                                                                                                                                                  GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                         Q9JPS7
                                                                                                                                                                                                                                                                                                               MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                         STRAIN-BZ147
                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
            181
                               121
                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                    61
                                                                                      61
                                                                                                                                                       Local Similarity
                                                                                                          _
                                                                                                                           ۲
                                                                                                                                                                                                                                                                                                                                                                                                                                                           11
                                                                                                       GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                XXXXXXXXXXXXFTYSLKKXLXXXXXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                          MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         604
                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                          PROTEIN
                             NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                       89.3%;
                                                                                                                                                                                                                                                                                                                                                                                          GNA992.
                                                                                                                                                                                                                                                                                                                                                              beta
                                                                                                                                              0,
                                                                                                                                                       Score 2230.5;
Pred. No. 3.1e
                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                              subdivision;
                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                        591
                                                                                                                                                        .1e-123;
                                                                                                                                                                                                                                                                                                                                                                                                                                        ₽
                                                                                                                                              122;
                                                                                                                                                                DB 2;
                                                                                                                                                                                                                                                                                                                                                            Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                              Indels
                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                           Arico' B.,
., Capecchi
                                                                                                                                                                                                                                                                        Zuo
                                                                                                                                              13;
                                                                                                                                                                                                                                                                                                                                                             Neisseria.
                                                                                                                                                                                                                                                                      Nuti S.
                                                                                                                                                                                                                                                           , H
                                                                                     120
                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        465
           240
                              170
                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     360
                                                                                                                                              ω
``
```

```
RESULT
Q13QV3
AC Q1
D1 Q1
D1 Q1
D1 Q1
D1 Q1
Q1 Q
   밁
                                                     Qy
                                                                                                                           В
                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q93QY3;
01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-EG329;

Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennir Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennir Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennir Peak I.R., Strikhanta Y., Dieckelman M., Moxon R., Jennir Peak I.R., Moxon R., Moxon R., Jennir Peak I.R., Moxon R., Jennir Peak I.R., Moxon R., Jennir Peak I.R., Moxon R., M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-DEC-2001 (TrembLrel.
01-DEC-2001 (TrembLrel.
01-DEC-2001 (TrembLrel.
NHHA OUTER MEMBRANE PROT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q93QY3
      171
                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   468
                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             588 GYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 171 TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity
                                                                                                                                                                                                                                                            2
                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12
                                                                                                                                                                                                                                                                                                                                                                                                                        MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GYQW 604
                                    TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                        MNEILRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LNYGSKXXNKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNXIDNYXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                               XXXXXXXXXXXXXTTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                            YLDPVLRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                           NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pred. No. 3.1e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2230.5; DB 2;
No. 3.1e-123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             48C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                          180
                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     288
```

ω ••

```
QUENTAL PART OF THE PART OF TH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                       STRAIN-MC58 / SEROGROUP B;

MEDLINE-2017575; PubMed=10710307;

Tettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., Nelson Eisen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J., Relson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K., Nelson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K., Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Dougherty Mason T., Ciecko A., Parksey D.S., Blair E., Cittone H., Clark Cotton M.D., Utterback T.R., Khouri H., Oin H., Vanathevan J., Gill J., Scarlato V., Masignani V., Pizza M., Grandi G., Sun L., Smith H.O., Fraser C.M., Moxon E.R., Rappuoli R., Venter J.C.;

"Complete genome sequence of Neisseria meningitidis serogroup B
                         "Complete
MC58.";
Science 28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.

STRAIN-MC58 / SEROGROUP B, BZ169, BZ83, AND H44/76;

MEDLINE-20175756; PubMed-10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Commanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROTEIN).
GNA992 OR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q9JR18 PRELIMINARY; PRT; 591 AA.
Q9JR18;
Q9JR18;
Q1-OCT-2000 (TrEMBLrel. 15, Created)
Q1-OCT-2000 (TrEMBLrel. 15, Last sequence update)
Q1-DEC-2001 (TrEMBLrel. 19, Last annotation update)
QUITER MEMBRANE PROTEIN GNA992 (ADHESIN) (NHHA OUT)
                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM STRAIN-MC58
                                                                                                                                                                                                                                                                                                                                                                                                                                          Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis, and
Neisseria meningitidis (serogroup
Bacteria; Proteobacteria; beta sul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=487, 491;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VSPSKGKMDETVNINAGNNIEITRNGKNIDIATSWTPQFSSVSLGAGADAPTLSVD-GDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                       FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NMB0992 OR NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           oup B).
subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tion update)
(NHHA OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseriaceae; Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEMBRANE
                                                                                                                                                                                                                                                                              Nelson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nuti S.,
                                                                                                                                                                                     H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     в.
                                                                                                                                                                                                                  в.А.,
                                                                                  strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            348
                                                                                                                                                                                                                                                                                                       .
[1]
```

RESULT Q93QY4 ID QS AC QS DT 01 DT 01

14

Q93QY4 Q93QY4; 01-DEC-2001 01-DEC-2001

PRELIMINARY;
(TrEMBLrel.
(TrEMBLrel.

19, 19,

Created) Last seq

sequence

update)

PRT;

594

8

```
В
                                                           Qy
                                                                                 밁
                                                                                                   Qy
                                                                                                                         В
                                                                                                                                            Qy
                                                                                                                                                                    В
                                                                                                                                                                                     ρy
                                                                                                                                                                                                            В
                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                  20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Peak I.R., Srikhanta Y., Dieckelman M., Moxon R.,
"Identification and characterization of a gene encommembrane protein of Neisseria meningitidis.",
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ data
EMBL; AF226375; AAF42524.1;
EMBL; AF226376; AAF42595.1;
EMBL; AF226370; AAF42519.1;
EMBL; AF226374; AAF42519.1;
EMBL; AF226374; AAF42523.1;
EMBL; AF226374; AAF42523.1;
EMBL; AF226374; AAF42523.1;
EMBL; AF226374; AAF42523.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Complete SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; AF157611; AAK68872.
TIGR; NMB0992; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SPECIES=N.meningitidis; STRAIN=PMC21; Peak I.R., Srikhanta Y., Dieckelman M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  [3]
SEQUENCE FROM N.A.
588
                    601
                                         528
                                                              541
                                                                                   468
                                                                                                      481
                                                                                                                           409
                                                                                                                                               421
                                                                                                                                                                     349
                                                                                                                                                                                          361
                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                      231
                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                              171
                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                             289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          y Match
Local
                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                         1
                                                                                                                                                                                                                                                                                                                                                                                                                       GYQW
                    GYOW
                                                                                                                         GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                         TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX
                                                                                          LNYGSKXXNKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNXIDNYXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                              TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                          AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                  \verb|LNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIAT|
                                                                                                                                                                                                                                                      GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                   XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                               YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                        AGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 al Similarity
469; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    proteome.
591 AA;
                    604
591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                       -NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62112 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2230.5; DB 16
Pred. No. 3.1e-123;
0; Mismatches 122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7C22F3CAE7F73EC6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Moxon R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Jennings M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      outer
                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                            180
                                          587
                                                              600
                                                                                   527
                                                                                                                          467
                                                                                                                                                480
                                                                                                                                                                     408
                                                                                                                                                                                                             348
                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                      288
                                                                                                                                                                                                                                                                                               230
                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                       170
                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                              60
```

Ψ

```
RESULT
Q9JPI3
ID Q9
AC Q9
DT 01
DT 01
                                                                                                                                                        δÃ
                                                                                                                                                                           В
                                                                                                                                                                                                            밁
                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                             ô
                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                        δÃ
                                                                                                         В
                                                                                                                       γ
                                                                                                                                        DЬ
                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity 77.0
Matches 469; Conservative
Q9JP13;
Q9JP13;
Q1-OCT-2000
Q1-OCT-2000
Q1-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings "Identification and characterization of a gene encoding a n membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157605; AAK68866 1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-EG327;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-DEC-2001 (TrEMBLrel. 19, NHHA OUTER MEMBRANE PROTEIN
                                                                           591
                                                                                          601
                                                                                                          531
                                                                                                                           541
                                                                                                                                           471
                                                                                                                                                           481
                                                                                                                                                                            411
                                                                                                                                                                                            421
                                                                                                                                                                                                            351
                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                             291
                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                              233
                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                               173
                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                               117
                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                58
                                                                                                                                                                                                                                                                                                                                                                                               61
                                                 15
                                                                          GYQW
                                                                                                                                                                                                                                                                                                                                                                                                             GYQW
                                                                                                         GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                       TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                               YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                       LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                             GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                              TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                       XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                               ----NTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAE
                                                                           594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitidis
(TrEMBLrel.) (TrEMBLrel. (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         594 AA;
                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       89.2%;
 15,
16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          beta
Created)
Last sequ
Last anno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2230; DB 2;
Pred. No. 3.4e-123;
0; Mismatches 125;
                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9DDD48B04B3A8EA2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          subdivision;
sequence update)
annotation update)
                                  594
                                 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  м.
Р.
                                                                                                                                                                                                                                                                                                                                                                                                                                               10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         outer
                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                              116
                                                                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                                                                                                                               57
                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                           470
                                                                                                                                                                                            480
                                                                                                                                                                                                            410
                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                               172
                                                                                                                          600
                                                                                                                                                          540
                                                                                                                                                                                                                                             350
                                                                                                                                                                                                                                                                             290
                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                              232
                                                                                                                                                                                                                                                                                                                                                                                                                                                4;
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                        Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                   ρ
                                           B
                                                             δÃ
                                                                                       Ъ
                                                                                                            Q
                                                                                                                                     В
                                                                                                                                                      δō
                                                                                                                                                                                 밁
                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local S
Matches 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-NG3/88, AND BZ232;

X MEDLINE=20175755; PubMed=10710308;

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti,

A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuoo P.,

A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

A Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).

Science 287:1816-1820(2000).

SEQUENCE 594 AA; 62086 MW; 1B25E03B90D04B46 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OUTER MEMBRANE GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                        117
                                                                                                                                                          421
                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                          173
591
                     601
                                                                                        471
                                                                                                              481
                                                                                                                                      411
                                                                                                                                                                                   351
                                                                                                                                                                                                        361
                                                                                                                                                                                                                                291
                                                                                                                                                                                                                                                                              233
                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                   58
                                                                                                                                                                                                                                                                                                                                                                                                                                          61
GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                              GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                        TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                  cal Similarity
469; Conser
                    GYOW 604
                                          LNYGSKXXNKPYRITNVAPGYKEGDYTNVAQLKGYAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                     VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKV
                                                                                                                                                                                                                                          VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                              GTT--ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                          TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                        ----NTDENTNASSFTYSLKKDLTDLTSVETEKLSFGANGKKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                    XXXXXXXXXXXXTTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                  YLEPVQRTAPVLSFHADSEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Proteobacteria; beta subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            89.2%; ilarity 77.6%; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROTEIN GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches 125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2228; DB 2;
No. 4.4e-123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Chi B.
Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Η.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;;
                                                                                                                                                                                                                                                                                                                                                                                                                    116
                                                                                                                540
                                                                                                                                                             480
                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                        172
                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  57
                                                                                          530
                                                                                                                                                                                    410
                                                                                                                                                                                                                                350
                                                                                                                                                                                                                                                                               290
```

4

Search completed: July 3, 2002, 08:28:49 Job time: 1170 sec

, 15

```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OM protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Minimum DB seq
Maximum DB seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Scoring
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Result
     Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             table:
  128
126.5
126.5
126.5
122.5
122.5
122.5
122.5
122.5
123.5
123.5
124.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
119.5
11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-771-382-11
2499
1 MNXIXRIIWNSALNAWVXVS...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                July 3, 2002, 08:30:20; Search time 48.34 Seconds (without alignments) 483.794 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105224 seqs, 38719550 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SwissProt_40:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                              Length
     DВ
ICEN_XANCT
OMPB_RICCN
120K_RICRI
ICEK_PSESX
ICEY_PSESX
ICEY_PSESX
ICEA_PANAN
ICEA_PANAN
ICEA_PANAN
ICEA_PANAN
ICEA_PANAN
ICEA_PANAN
ICEN_PSESY
ICEN_PANAN
ICEN_PSEST
ICEN_PANAN
ICEN_PSEFL
ICEN_PANAN
ICEN_PSESX
ICEN_PSESX
ICEN_PANAN
ICEN_PANAN
ICEN_PANAN
ICEN_PANAN
ICEN_PANAN
ICEN_PANAN
ICEN_PSESX

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .....TASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           105224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P15320 serratia ma
P20469 pantoea ana
P35827 campylobact
P11818 human adeno
006653 r outer mem
052657 rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             030611
033479
P15921
                                                                                                                                                                           P06620
P35828
P047879
P06239
P162393
P965393
P965389
P35829
P38536
P568666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q9kka3 r outer mem
P14914 rickettsia
Q53047 r outer mem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Description
        O pseudomonas
Caulobacter
S pantoea ana
S pseudomonas
S erwinia her
C chlamydia p
F outer mem
S lactobacill
C tamylopacil
C tamylopacil
C tamylobact
C proteus mir
C proteus mir
C proteus mir
C secherichia
C acenorhabdi
C secherichia su
C listeria su
C li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        pseudomonas
pseudomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   xanthomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      campylobact
salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        outer mem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              604
```

45	44	43	42	41	40	39	38	37	36	35	34	
107.5	107.5	108	108	108	108.5	109	109	109	109.5	109.5	110	
4.3	4.3	4.3	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.4	
1643	389	1848	1036	666	550	1398	1153	512	1325	762	1039	
Н	ш	ш	<u>,                                    </u>	Н		_	1	۳	_	-	-	
OMPB_RICPR	SERI_BOMMO	CBPA_CLOCL	HPI2_DEIRA	MUR2_ENTHR	FLIC_SHIFL	TOP2_PLAFK	PVDB_PLAKN	FLAA_HELFE	YDEK_ECOLI	SLAP_ACEKI	AG43_ECOLI	
Q53020 r outer mem	PU/856 DOMDYX MOTI	P38058 CLOSEFICIUM	PI3126 deinococcus	P39046 EIICELOCOCCU	TI PITERING 098800	SSSSS Standardii	PS0493 prasmourum	Q9xD36 Herropacte	P32USI escrierichia	P22238 acerogenium	p39180 escherichia	

## ALIGNMENTS

	Quer Best Matc	מס אוס ס ס אוט		UNICO CONTRA CON
	<b>⋾</b> ~	EMBE, x52970; CAA37140.1;  PIR; S11672; S11672.  INA.  InterPro; IPR000258; Ice_nucleatn.  Pfam; Pf00818; Ice_nucleation; 81.  PRINTS; PR00327; ICENUCLEATN.  PROSITE; PS00314; ICE_NUCLEATION;  ICE nucleation; Repeat; Outer memb  SEQUENCE 1567 AA; 152548 MW; C	his he se od	ICEN_XANCT STANDARD; PRT; 1567 AA.  P18127;  P18127;  Ol-NOV-1990 (Rel. 16, Created) Ol-NOV-1990 (Rel. 16, Last sequence update) Ol-NOV-1990 (Rel. 16, Last sequence update) Ol-NOV-1990 (Rel. 40, Last annotation update) ICE nucleation protein.  INAX.  Xanthomonas campestris (pv. translucens). Bacteria; proteobacteria; gamma subdivision; Xanthomoras.  NCBL_TaxID=343;  [1] SEQUENCE FROM N.A. STRAIN=X565; MEDLINE=91080859; PubMed=2259339; ZEROINE=51080859; PubMed=2259339; SCOURCE FROM N.A. STRAIN=X565; MEDLINE=91080859; PubMed=2259339; ZONSET C.S.; "Conserved repetition in the ice nucleation gene inaX "CONSERVED TO THE SUBCELLULAR LOCATION: Outer membrane (By similari-1-1 SUBCELLULAR LOCATION: Outer membrane (By similari-1-1 DOMAIN: CONTAINS 153 IMPERFECT REPEATS OF THE CONTAINS CONTAINS 153 IMPERFECT REPEATS OF THE CONTAINS CONTAINS 153 IMPERFECT SUBCELTUDE A-G-Y-G-S-T-L-T; FURTHER ON A 16-RESII REGIONAL 48-RESIDUE PERIODICITY IS SUBCESTED IN NUCLEATION PROTEIN DISPLAYS A SYMMETRY RELAXIED TO -1- MISCELLANEOUS: A STRUCTURAL MODEL IS SUBCESTED IN NUCLEATION DISPLAYS A SYMMETRY RELAXIED TO -1- SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION FAMILY.
	Match Local Similarity Les 85; Conser	x51 S11 Pro Pro Pro PFO PFO PFO PFO PFO PFO PFO PFO PFO PFO	his SWISS-PROT entry etween the Swiss In Bioinfor the European Bioinfor se by non-profit oddfied and this stantities requires a lar send an email to large send an emai	PANCT STANDARD; PR 27; 27; 27; 29; 27,-1990 (Rel. 16, Created) 27,-2001 (Rel. 16, Last seque 27,-2001 (Rel. 16, Last seque 27,-2001 (Rel. 16, Last annot nucleation protein. homonas campestris (pv. tran bence from N.A. TaxID=343; TaxID=313; Ta
	imila ; Cc	170; 520; 1PR0 1PR0 1818; 80032 98003 156	he Shan Band ton-p	90 (Rel.) 90 (Rel.) 90 (Rel.) 91 (Rel.) 91 (Rel.) 92 (Rel.) 93 (Rel.) 94 (Rel.) 95 (Rel.) 96 (Rel.) 97 (Re
	rity	X52970; CAA37; \$11672; S11672; P06620; 11NA. PF00818; ICe_ S; PR00327; IC ICE; PS00314; IC ICL STORY REP NCE 1567 AA;	PROT entry e Swiss Ins n Bioinform n-profit i d this stat quires a li email to li	STANDAN LL 16, LL 40, Protein Pestri Sobacte
	5. larity 19. Conservative	7140. 2. 3; Ic nucl nucl ENUC ICE_N peat;	ntry is cops Institute if institute institute institute institute statement a license to license	90 (Rel. 16, Created Protein. 90 (Rel. 16, Last 101 (Rel. 40, Last 101 (Pv Proteobacteria; Proteob
	7ø; 2ø;	0.1; Ice_nuccleatic Cleatic UCLEATI LNUCLEA t; Outc	stitute matics I institut tement i icense a icense@i	Created) Last sequ Last sequ Last anno n. (pv. tra ria; gamma ria; gamma ria; gamma ria; gamma ria; gamma n. (in the ic s pv. tra iin t
	Score Pred. 55; Mi	:leat on; 8 I. TION TION MW;	SWISS-PROT entry is copyright. It is produced through the Swiss Institute of Bioinformatics and the European Bioinformatics Institute. There are no rest by non-profit institutions as long as its content by non-profit institutions as long as its content (fied and this statement is not removed. Usage by an ities requires a license agreement (See http://www.isb-end an email to license@isb-sib.ch).	ANCT STANDARD; PRT; 1567 AA.  27; 27; 27; 290 (Rel. 16, Created) OV-1990 (Rel. 16, Last sequence update) OV-1990 (Rel. 40, Last sequence update) Inucleation protein.  Cornors campestris (pv. translucens).  INUCLEATION In the ice nucleation gene inax from served repetition in the ice nucleation gene inax from served repetition in the ice nucleation gene inax from served repetition in SUPERCOOLED WATER.  Gen. Genet. 223:163-166(1990). FUNCTION: ICE NUCLEATION PROTEINS ENABLE BACTERIA TO NUCLEATE CRYSTALLIATION IN SUPERCOOLED WATER.  SUBCELLULAR LOCATION: Outer membrane (By similarity).  SUBCELLULAR LOCATION: OUTER MATER ON A 16-RESIDUE AND A REGIONAL 48-RESIDUE PERIODICITY IS SUPERRMPOSED.  NISCELLANDOUS: A STRUCTURAL MODEL IS SUPERRMPOSED IN WHICH THE ICE NUCLEATION PROTEIN SAMILY.  FAMILY.  FAMILY.  FAMILY.
	Ø	n. 1. ; 57 mbrai	ht. I Bioin Bioin Situte s as ot re ement sib.c	ttion nucl nucl nucl nucl nucl nucl nucl nuc
	142.5; No. 0. matche	57. brane. C8B451D959ECAD63	form form 1 long long move (Se	1567 A update n upda ens). ivisic ivisic ivisic sens."; ANTER. ANTER. ATERER OTHER (OTHER (OTHER) IS SUI
	D 17	59EC1	matics There g as red. U See htt	AA.  te) date) date) ion; X. ion; X. ion ge ; ion A ion GBY con A uperim con A
	В 1; ; 235;		coduced ics and re are n as its c Usage nttp://w	anthc anthc ne ii i.mil
	Length Indels	CRC64;	luced through a collabora s and the EMBL outstati are no restrictions on its content is in no large by and for commer tp://www.isb-sib.ch/annou	ence update) ence update) tation update)  nslucens). nslucens). subdivision; Xanthomonas group; subdivision; Xanthomonas group; subdivision; Xanthomonas group; subdivision; Xanthomonas group; pslucens.*; pslucens.*; pslucens.*; pslucens.*; pslucens.*; remmbrane (By similarity). membrane (By similarity). membrane (By similarity). remmbrane (By similarity).
	15	`.	y EM Estr estr ant and sb-s	s grous grous grous gron
	1567; 67;		a col	group;  m  nucleate  Sus  AND A  ANT OF ICE  PROTEIN
2	Gaps		ollabora outstat: lons on in no r commes ch/annou	E E
j			yyright. It is produced through a collaboration of Bioinformatics and the EMBL outstation. Institute. There are no restrictions on its strions as long as its content is in no way is not removed. Usage by and for commercial agreement (See http://www.isb-sib.ch/announce/sisb-sib.ch).	
	14;		its its way ial	i

ş

178 TAXTNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKG 237

```
RESULT 2
OMPB_RICCN
ID OMPB_R
AC Q9KKA3
DT 16-OCT
CORICKET
OC RICKET
OC STRAIN
RA GOUX V
RT "PHY 10-
RT SEQUEN
RA ROUX V
RT "PHY 10-
RT GENE CO
RT GENE CO
RT GENE CO
RT GENE CO
RT THE T
RT SEQUEN
RC STRAIN
RA STRAIN

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
Stenos J., Walker D., Stenos J., Walker D., Stenos J., Walker D., Stenos J., Walker D., The rickettsial outer membrane protein A and B genes of "The rickettsia of the spotted f australis, the most divergent rickettsia of the spotted f submitted (MAY-1999) to the EMBL/GenBank/DBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Science
[2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OMPB_RICCN STANDARD; PRT; 1655 AA.

O9XKA3; Q9KK98; O9XC45;

16-OCT-2001 (Rel. 40, Created)

16-OCT-2001 (Rel. 41, Last sequence update)

O1-MAR-2002 (Rel. 41, Last annotation update)

Outer membrane protein B precursor (168 kba surface-layer protein)

(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rompB)

(TOMp B) [Contains: 120 kba surface-exposed protein (Surface protein antigen) (120 kba outer membrane protein ompB); 32 kba beta peptide
                                                                                                                                                                                                                               STRAIN=Malish
                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                    "Phylogenetic analysis of membe
gene coding the outer-membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-Indian tick typhus, and Mal MEDLINE-20393643; PubMed-10939649;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=21442074; PubMed=11557893; Ogata H., Audic S., Renesto-Audiffren Samson D., Roux V., Cossart P., Weisse
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Roux V., Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A. STRAIN=Malish 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Mechanisms
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Raoult
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rickettsia conorii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rickettsiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1014
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               865
                                                                                                                                                                                                                                                                                                                                      J. Syst.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OR RC1085.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STAGHESSLIAGYGSTQIAGYE 1255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VDXXXALNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDI---ATSMXPQFSSVSLGAGADAPTLS: | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | : | | : | : | | : | : | | : | : | | : | : | | : | : | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NSRGH - - - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -NSILTTGYGSTQTAQESSSLTAGYGSTSTAGYDSTLTAGYGSTQTAGYKSTLTAGYGSN 1233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AQAIATAGLXQAYLPGKSMMAIGGXTYXGEAGY----AIGYSSISXXG--NWXIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YDSNLTAGYGSTQTAR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AGYGSTQTAGSDSSLTAGYGST-QTARQGSDITAGYGSTGTAGADSSLIAGYGS-TQTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TXVTFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVI 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKLVTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VKXGXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADSTLIAGYGSTQTAGSD--SSLTAGY---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STLIAGYGSTQTSGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGTAGADSTL-ISGYGSTQT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   isms of evolution in Rickettsia 293:2093-2098(2001).
                                                                                                                                                                                                                                                                     ę
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -GSTGTAGADSTLIAGYGSTQTSGSDSSLTAGYGSTQTARKGSDMTAGYGSTGTAGAD
                                                                                                                                                                                                                                                                 353-1655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  33-1649 FROM N.A
                                                                                                                                                                                                                                                                                                                                      Evol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -FGXSASVGYQ
                                                                                                                                                                                                                                                                                                                                  Microbiol.
                                                                                                                                                                                                                                                              FROM
                                                                                                                                                                                                                                                                                                                                                                                                          of members
                                                                                                                                                                                                                                                                 z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      603
                                                                                                                                                                                                                                                                                                                          ers of the genus Rickettsia protein rOmpB (ompB)."; 50:1449-1455(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 iffren P., Fo
Weissenbach
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EDSSLTAGYGSTSTAGHDSSLIAGYGSTQTAGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ---AGSDSSLTAGYGSTQTARKGSDVTAGY----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DSSLTAGYGSTQTAREGSDVTAGYGSTGTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -GSTQTARQGSDVTAGYGSTGTAGADSTLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            conorii and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Fournier P.-E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Rickettsiales
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P.-E.,
                                         A MAJOR
                                                                                                          fever
                                                                                                                                            Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 J.-M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Barbe V.,
                                                                                                                                                                                                                                                                                                                                                                                                  using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein
                                                                                                                                                                                                                                                                                                                                                                                                      the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1013
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    967
```

```
Ωy
                                                                                                                                멍
                                               Qy
                                                                        Matches
                                                                                 Query Match
Best Local (
                                                                                                                                        CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                        VARIANT
VARIANT
                                                                                                                                                                                                                                                         VARIANT
VARIANT
                                                                                                                                                                                                                                                                                CHAIN
VARIANT
                                                                                                                                                                                                                                                                                                                                                               EMBL;
                                                                                                                                                                                                                                                                                                                                                                          EMBL;
                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                     EMBL; AF149110; AAD39533.1; -.
InterPro; IPR003858; rOmpA_rOmpB.
                           430
                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                VARIANT
                                                                                                                                                                                                                                                                                                        CHAIN
                                                                                                                                                                                                                                                                                                                 Antigen;
                                                                                                                                                                                                                                                                                                                            Pfam; PF02708; rOmpA_rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                    modified
                                                                                                                                                                                                                                                                                                                                                                                                                                              use
                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -
    295
                                                 249
                                                                                                                                                                                                                                                                                                                                                                                                           or send
                                                                                                                                                                                                                                                                                                                                                                                                                       entities
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SIMILARITY).
FUNCTION: THE 3:
(BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                      SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LAYER WITH HEXAGONAL SYMMETRY (BY SIMIL SIMILARITY: BELONGS TO THE RICKETTSIAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SUBCELLULAR LOCATION: CELL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE VIRULENCE FACTOR AND/OR IMMUNOGEN DURING
EKDGKLVTGKXKXENXSSTDXGEGLVT---AKEVIDAVNKAGWRMKTTTANGQTGQADKF
                      NTAGVITEDANGTLASASADANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSVFK
                                             NVDEVXTYD---TVEFLSADTKTTTVN----VESKDNG------KXTEVKIGAKTSVIK 294
                                                                                                                                                                                                                                                                                                                                                              AE008659;
AF123721;
AF123726;
                                                                       94;
                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                       non-profit institutions as long as its content is in no way d and this statement is not removed. Usage by and for commercial s requires a license agreement (See http://www.isb-sib.ch/announce/an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                S-layer;
                                                                                                                                                                                                                        1335
61
75
78
78
251
413
959
                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                  ; AAL03623.1;
; AAF34124.1;
; AAF34129.1;
; AAD39533.1;
                                                                                                                              AA;
                                                                                                                                                                          1334
1655
61
75
78
251
413
959
988
1139
354
776
                                                                                                                                                                                                                                                                                                                 Cell wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 32 KDA
                                                                                 5.7%;
                                                                                                                              168342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SYMMETRY (B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BETA
                                                                                                                      120 KAA SÜRFACE-EXPOSED PRC
32 KDA BETA PEPTIDE.
P -> A (IN STRAIN INDIAN T)
G -> S (IN STRAIN INDIAN T)
G -> S (IN STRAIN INDIAN T)
K -> N (IN STRAIN INDIAN T)
V -> A (IN STRAIN INDIAN T)
V -> A (IN STRAIN INDIAN T)
N -> T (IN STRAIN INDIAN T)
N -> T (IN STRAIN INDIAN T)
A -> T (IN REF. 3)
C -> S (IN REF. 3)
E -> D (IN REF. 3)
G -> S (IN REF. 3)
H -> R (IN REF. 3)
H -> R (IN REF. 3)
                                                                      50;
                                                                                          Score
                                                                                  Pred.
                                                                                                                                                                                                                                                                                                                Complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PEPTIDE MAY
                                                                      Mismatches
                                                                                 142.5; DE NO. 0.018;
                                                                                                                                                                                                                                                                                                    SURFACE-EXPOSED PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               THIS BACTER
                                                                                                                                                                                                                                                                                                                                                                                                                                         There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SERVE AS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BACTERIUM
                                                                                           DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OMPA/OMPB FAMILY
                                                                      183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AS A RICKETTSIAL INFECTION (BY
                                                                                          1;
                                                                                                                             CRC64;
                                                                    Indels
                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ×
                                                                                                                                                                                            N TICK TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \mathbf{S}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COVERED
                                                                    73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BΥ
                                                                  Gaps
 351
                      489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                    20;
```

```
δÃ
                                                                                            ρy
                                                                                                                               밁
                                                                                                                                                            δÃ
                                                                                                                                                                                             Db
                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                           밁
      774
                                   553
                                                                 724
                                                                                                 501
                                                                                                                               665
                                                                                                                                                             450
                                                                                                                                                                                             605
                                                                                                                                                                                                                            396
                                                                                                                                                                                                                                                            547
                                                                                                                                                                                                                                                                                           352
                                                                                                                                                                                                                                                                                                                           490
   VKFLGNATFNGNTTIAAN-
                                                                                                                                                                                                         QLQNSGWNLDSKAVAGSSSGKVISGNVSPSKGKM-DETVNIN---AGNN--IEIXRNGKNI
                               MMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRG
                                                               VNL-YATNITTTDA--
                                                                                          VKEGDVTNVAQLKGVAQNLNNXIDNVXG-NARAGIAQAIATAGLXQ
                                                                                                                            TRTTNAAGQGKIIFNPVVNNNTTLATGTNLGS-ATNPLAEINFGSKGAANVDTVLNVGKG
                                                                                                                                                             DIATSMXPQ----FSSV----
                                                                                                                                                                                        NAQTLTINGKIGTVGANNKTLGQFNIGSSKTVLSDGDVAINELVIGNNGAVQFAHNTYLI
                                                                                                                                                                                                                                                      KTLTLGGANIIGANGGTINFQANGGTIKLTS--TQNNIVVDFDLAIATDQTGVVDASSLT
                                                                                                                                                                                                                                                                                     ETVT-----SGTXVTFASGXGTTATVSKDDQGNITVXXDV------NVGDALNVN 395
                                                                                                                                                                                                                                                                                                                      LADGTVINGKVNQTALVGGALAAGTITLDGSATITGDIGNAG---GAAALQGITLANDAT
                                                            -NVGSFIFNAGGTNIVSG-----TVGGQQGNKFNTVALDNGTT
STLOIGGNYTADEVASADGTG
                                                                                                                                                        -SLGAGADAPTLSVDXXXALNVGSKXXNKPVRITNVAPG
                                                                                            AYLPGKS
                                                                                            552
                                                                                                                            723
                                                                                                                                                                                        664
                                                                                                                                                                                                                        449
                                                                                                                                                                                                                                                                                                                     546
```

```
PERFERENCE PRODUCTION OF THE P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120K_RICRI
P14914;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CARBOHYD
CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Antigen;
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entropean Bioinformatics Institute. There are no restructe by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use as long as its content use as long as long
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P120.
                                                                                                                                                                                                                                                                                                                                                        CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gilmore R.D. Jr., Joste N., McDonald G.A.; "Cloning, expression and sequence analysis of the 120 kD surface-exposed protein of Rickettsia ricke Mol. Microbiol. 3:1579-1586(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-FEB-1996
01-MAR-2002
                                                                                 CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIR; S07575; S07575.
InterPro; IPR003858; rOmpA_rOmpB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entities
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Rickettsiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-APR-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=90136087;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ptam;
                                                                                                                                        CARBOHYL
                                                                                                                                                                                            CARBOHYD
                                                                                                                                                                                                                      CARBOHYD
                                                                                                                                                                                                                                                                          CARBOHYD
                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                    CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S-LAYER WITH HEXAGONAL SYMMETRY.
MISCELLANEOUS: ITS C-TERMINUS POTENTIALLY MAY BEAR THE E-
CONFERRING ANTICENICITY TO THE PROTEIN.
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FUNCTION: MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         kDa surface-exposed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PF02708;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   X16353; CAA34402.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          s requires a license agreement (S an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    rickettsii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     rOmpA_rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14, Created)
33, Last sequence up
41, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PubMed=2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                alpha subdivision; Rickettsiales;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              wall;
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              s-layer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                               (POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                         (POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                 (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                           (POTENTIAL).
                                                                                                                                        (POTENTIAL).
                                                       (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             rickettsii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                encoding i.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EPITOPES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 4
OMPB_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CARBOHYD
CARBOHYD
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              30-MAY 2000 (Rel. 39, Created)
30-MAY 2000 (Rel. 39, Last sequence update)
30-MAY 2001 (Rel. 40, Last annotation update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(TOmp B) (Contains: 120 kDa surface-exposed protein (Surface protein)
antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CARBOHYD
                                                                                                                                                                                                                                            MEDLINE-9210/802; Fubwed-1.7. Policastro P.F., Hackstroglimore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstroglimore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstroglimore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstroglimore R.D. Jr., Hackstroglimore R.D. Jr., Policastro P.F., Hackstroglimore R.D. Jr., Policas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q53047;
30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Proteobacteria; Rickettsiaceae; Rickettsia
                   Gilmore R.D. Jr., Joste N., McDonald G.A.; "Cloning, expression and sequence analysis of the 120 kB surface-exposed protein of Rickettsia ricke Mol. Microbiol. 3:1579-1586(1989).
                                                                                                                                                                                                                                  evidence for
                                                                                                                                                                                                                                                                                                        MEDLINE=92167802; PubMed=1724278; Gilmore R.D. Jr., Cieplak W. Jr.,
                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rickettsia rickettsii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OMPB_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         249 NVDFVXTYD--
                                                                                                                MEDLINE-90136087; PubMed=2515418;
                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EKDGKLVTGKXKXENXSSTDXGEGLVT---AKEVIDAVNKAGWR----MKTTTANGQTGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NTAGVITFDANGTLESASADANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSIFK 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DKFETVTSGTXVTFASGXGT------TATVSKDDQGNITVXYDVNVG-DALNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LADGTVINGKVNQTALVGGALAAGTITLDGSATITGDIGNAGGAAALQRITLAN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QQGNKFNTVALENGTTVKFLGNATFNGNTTIAAN-STLQIGGNYTADCVASADGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           XQ-----AYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXG-NARAGIAQAIATAGL 543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV-NINAGNNIEIXRNG----KNID 450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTST----QNNIVVDFDLAIATDQTGV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IGNDGAVQFAHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAAGTNLGS-ATNPLAEINFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----VDASSLTNAQTLTINGKIG-TIGANNKTLGQFNIGSSKTVLSNGNVAINELV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                               30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1140
1146
1211
1300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                  279-1654
                                                                                                                                                                                                              protein processing f
ol. 5:2361-2370(1991)
                                                                                                                                                                                                                                                                                                                                                                                   N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -TVEFLSADTKTTTVN----VESKDNG-----KXTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1140
1146
1211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                132801
                                                                                                                                                                                                                                                                                                                                                                                                                                                           alpha subdivision;
eae; Rickettsia.
    SURFACE - EXPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 140; DB 1;
Pred. No. 0.021;
8; Mismatches 163
                                                                                                                                                                                                                                          from a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                E09E52C3F647243D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---SSVSLGAGADAPTLSVDXXXALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NVGSFVFNAGGTNIVSG
                                                                                                                                                                                                                                          large
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3
       PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              163;
                                                 f the gene encoding
rickettsii.";
                                                                                                                                                                                                                                       precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rickettsiales
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1300;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels 106;
       \mathbf{s}
                                                                                                                                                                                                                                                                                         Hackstadt T.;
of Rickettsia
    A MAJOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -TVGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22;
```

```
RESULT S
ICEK_PSESX
ID ICEK_P
AC 030611
DT 15-DEC
DT 15-DEC
DT 16-OCT
DE ICE nu
GN INAK.
OS PSEUdo
OC PSEUdo
OX NCBI_T
RN [1]
RP SEQUEN
RC STRAIN
                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                           030611;
15-DEC-1998
15-DEC-1998
16-OCT-2001
          SEQUENCE FROM N.A. STRAIN-KCTC 1832;
                                                                               Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DOMAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                    NCBI_TaxID=317;
                                                                                                  Pseudomonas syringae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      InterPro; IPR003858; rOmpA_rOmpB.
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; X16353; CAA34403.1; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                       ICEK_PSESX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -
                                                                                                                                                                                                                                                                               757
                                                                                                                                                                                                                                                                                                                                      708
                                                                                                                                                                                                                                                                                                                                                                   485
                                                                                                                                                                                                                                                                                                                                                                                               649
                                                                                                                                                                                                                                                                                                                                                                                                                          451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                430
                                                                                                                                                                                                                                                                                                                                                                                                                                                       598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    295
                                                                                                                            nucleation protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.
SUBCELLULAR LOCATION. CELL WALL. THIS BACTERIUM IS COVERE!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                         QGGNKFNTVALENGTTVKFLGNATFNGNTTIAAN-STLQIGGNYTADCVASADGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NVDFVXTYD---TVEFLSADTKTTTVN----VESKDNG-----KXTEVKIGAKTSVIK 294
                                                                                                                                                                                                                                                                                                                                                             SKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXG-NARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTST----QNNIVVDFDLAIATDQTGV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LADGTVINGKVNQTALVGGALAAGTITLDGSATITGDIGNAGGAAALQRITLAN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EKDGKLYTGKXKXENXSSTDXGEGLYT---AKEYIDAVNKAGWR---MKTTTANGQTGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTAGVITFDANGTLESASADANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSIFK 489
                                                                                                                                                                                                                                                                                                                                 SKGVNVDT-VLNVGEGVNL-YATNITTTDA---NVGSFVFNAGGTNIVSG-----TVGG
                                                                                                                                                                                                                                                                                                                                                                                          IGNDGAVQFAHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAAGTNLGS-ATNPLAEINFG
                                                                                                                                                                                                                                                                                                                                                                                                                          IATSMXPQF----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DKFETVTSGTXVTFASGXGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV-NINAGNNIEIXRNG----KNID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         89;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1334 16
1181 11
1654 AA;
                                                                                                                                                                                                                                                                                                      ---AYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRG
                                                                                                                                        (Rel. 37, Created)
(Rel. 37, Last seq
(Rel. 40, Last ann
                                                                                                                                                                                                                                                                                                                                                                                                                                                   -VDASSLTNAQTLTINGKIG-TIGANNKTLGQFNIGSSKTVLSNGNVAINELV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                     STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Cell wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5.6%;
21.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               168184
                                                                                                                                                                                                                                                                                                                                                                                                                    -------SSVSLGAGADAPTLSVDXXXALNVG
                                                                                  gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----TATVSKDDQGNITVXYDVNVG-DALNVN
                                                                                                                                           sequence u
annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 140; DB 1;
Pred. No. 0.027;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120 KDA SURFACE-EXPOSED 32 KDA BETA PEPTIDE. POLY-THR.
                                                                                 subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              D7AB70FB7087F618 CRC64;
                                                                                                                                                                                                    1148
                                                                                                                                                         update)
                                                                                                                                        update)
                                                                                                                                                                                                    A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      163;
                                                                                  Pseudomonadaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 1654;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels 106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COVERED
                                                                                                                                                                                                                                                                          811
                                                                                                                                                                                                                                                                                                      592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ВΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                      484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              45C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         395
                                                                                                                                                                                                                                                                                                                                                                                          707
                                                                                                                                                                                                                                                                                                                                                                                                                                                   648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          တ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22;
```

```
Qy
                                                                                                           Ъ
                                                                                                                                                          Ş
                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                 QУ
                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Jung H.-C., Pan. J.-G.;
Submitted (JUL-1997) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: ICE NUCLEATION PROTEINS ENABLE BACTERIA TO I
-I- SUBCELLULAR LOCATION: Outer membrane (By similarity).
-i- DOMAIN: CONTAINS MANY IMPERFECT REPEATS OF THE CONSENT OCTAPEPTIDE A-G-Y-G-S-T-L-T; FURTHER ON A 16-RESIDUE REGIONAL 48-RESIDUE PERIODICITY IS SUPERIMPOSED.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entre E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRINTS; PR00327; ICENUCLEATN.

PROSITE; PS00314; ICE_NUCLEATION; 38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; AF013159; AA
HSSP; P06620; 11NA
     587
                                                       564
                                                                                                           539
                                                                                                                                                                508
                                                                                                                                                                                                                  488
                                                                                                                                                                                                                                                                    452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ice nucleation; Repeat; Outer membrane.
DOMAIN 161 164 POLY-ALA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pfam; PF00818; Ice_nucleation;
                                                                                                                                                                                                                                                                                                                        434
                                                                                                                                                                                                                                                                                                                                                                             392
                                                                                                                                                                                                                                                                                                                                                                                                                               380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              152 EKLSFXANXXKVNIXSDTKGLNFAKXTAXTNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXX 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION PROTEIN
                              EAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASVGY
TAGY - - GSTQTARDGSYLIAGYGSTGTAGS-GSSLIAGY
                                                                                                                                                        ----NVAQLKGVAQNLNNXIDNVXGNARAGIAQAIATAGLXQAYLPGKSMMAIGGXTYXG
                                                                                                                                                                                                                                                                 ATSMXPQFSSVSLGAGADAPTLSVDXXXALNVGSKXXNKPVRITNVAPG----VKEGDVT
                                                                                                                                                                                                                                                                                                                   QTAQEGSNLTAGYGSTGTAGADSSLIAGYGSTQTSGSESSLTAGYGST-QTAREG-----
                                                                                                                                                                                                                                                                                                                                                                     LNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YGSTQTAQEGSNLTAGYGSTGTAGSDSSLIAGYGSTQTSGS------DSSLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SLTAGYGSTQTAQEGSNLTAGY-----GSTGTAGVDSSLIAGYGSTQTSGSDSALTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGWRMKTTTANGQTGQADKFETVTSGTXVTFASGXGTTATVSKDDQGNITVXYDVNVGDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NVESKDNGKXTEVKIGAKTSVIKEKDGKLVTGKXKXENXSSTDXGEGLVTAKEVIDAVNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGYGSTQTAQEGSNLTAGYGSTGTAGVDSSLIAGYGSTQTSGSDSA--LTAGY----GST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EDSSLTAGYGSTQTAQEGSNLTAGYGSTGTAGSDSSLIAGYGSTQT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     87; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IPR000258; Ice_nucleatn. 0818; Ice_nucleation; 57.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                            ·STLTAGYGSTG-TAGADSSLIAGYGSTQTSGSESSLTAGYGSTQTAQQGSVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAB66891.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1099
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5.2%;
19.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        113811 MW; BA4019CF20FAE224 CRC64;
                                                                                                         -TTGYGSTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 129; DB
Pred. No. 0.11
50; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       POLY-ALA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OCTAPEPTIDE PERIODICITY
                                                                                                         -----TAGHESFIIAGYGSTQTAGHKSIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 1; Length 1148;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   248;
622
                                                    602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                THE CONSENSUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUCLEATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ۵J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ×
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 commercial
                                                                                                                                                                                                                                                                 507
                                                                                                                                                                                                                                                                                                                                                                       451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              391
                                                                                                                                                                                                               538
                                                                                                                                                                                                                                                                                                                     487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          no
no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14;
```

RESULT 6
ICEV\_PSESX
ID ICEV\_PSESX
AC 033479;
DT 15-DEC-1998

STANDARD;

B

(Rel. 37, Created)

QΥ 밁 Qy B

밁

```
SOLD DESCRIPTION OF THE REAL PROPERTY OF THE REAL P
                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QY
δÃ
                                                     В
                                                                                                 δÃ
                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a between the Swiss Institute of Bioinformatics and the EMBI the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and it modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Schmid D., Pridmore D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-INA5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro; IPR000258; Ice_nucleatn.
Pfam; PF00818; Ice_nucleation; 61.
PRINTS; PR0037; ICE_NUCLEATION; 42.
PROSITE; PS00314; ICE_NUCLEATION; 42.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; AJ001086; CAA04521.1; -. HSSP; P06620; 1INA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pseudomonas syringae.";
FEBS Lett. 414:590-594(1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jann A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=97462815; PubMed=9323042;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pseudomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pseudomonas syringae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ice nucleation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15-DEC-1998 (Rel.
16-OCT-2001 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Molecular organisation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99
1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181 TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX 240
  481
                                                                                                                                                            409
                                                                                                                                                                                                                                                                      363
                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                              303
                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     259
                                                                                                          421
                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity 18.4 nes 79; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FOR ICE NUCLEATION ACTIVITY.

SUBCELLULAR LOCATION: Outer membrane (By similarity).

SUBCELLULAR LOCATION: Outer membrane (By similarity).

DOMAIN: CONTAINS MANY IMPERPECT REPEATS OF THE CONSENSUS

OCTAPEPTIDE A-G-Y-G-S-T-L-T; FURTHER ON A 16-RESIDUE AND

REGIONAL 48-RESIDUE PERIODICITY IS SUPERIMPOSED.

SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION PROTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CRYSTALLIZATION IN SUPERCOOLED WATER.
SUBUNIT: MEMBRANE ENVIRONMENT OR AGGREGATION SEEMS TO BE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nucleation; Repeat; Outer membrane.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FUNCTION: ICE NUCLEATION PROTEINS ENABLE BACTERIA TO NUCLEATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FAMILY.
  LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAGSDSSLIAGYGSTQT
                                                                                                                                                                                                                                                                                                                         VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                              GSTGTAGSDSSLIAGYGSTQTSGGDSSLTAGYGSTQTAQEGSNLTSGYGSTGTAGADSSL
                                                                                                                                                                                                                                                                                                                                                                                                                                GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                            SLIAGYGSTQTSGSD--SSLTAGY---
                                                                                                                                                                                                              {\tt TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN}
                                                                                                                                                                                                                                                                 IAGYGSTQTSGS.....DSALTAGYGSTQTAQEGSNLTAGYGSTGTAGSDS
                                                                                                       VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  37,
40,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                117991 MW; C9E9974CB1731E68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of the ice nucleation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Capitani G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----SGEDSSLTAGYGSTQTAQEGSNLTAGY-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pred. No. 0.13
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 128; DB 1;
Pred. No. 0.13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OCTAPEPTIDE PERIODICITY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        subdivision; Pseudomonadaceae;
                                                                                                                                                            -GSTQTAQEGSNLTAGYGSTGTAGVDSSLIAGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Battistutta R., Neeser J.-R.,
                                                       -STQTAQEGSNLTAGYGSTG-TAGADSSLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ICE NUCLEATION PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   222;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          by and for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Inav
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REQUIRED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ĺn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               commercia
                                                             507
                                                                                                             480
                                                                                                                                                                  462
                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                            408
                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                 362
                                                                                                                                                                                                                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ő
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11;
```

```
RESULT 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P15921;
01-APR-1990
01-APR-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                antigen) (rOmpA) (rOmp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Outer membrane protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Anderson B.E., McDonald G.A., Jones D.C., Re "A protective protein antigen of Rickettsia repeated, near-identical sequences.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rickettsiaceae;
NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacteria; Proteobacteria; alpha subdivision; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-APR-1990 (Rel. 14,
01-APR-1990 (Rel. 14,
16-OCT-2001 (Rel. 40,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OMPA_RICRI
                                                                                           REPEAT
REPEAT
                                                                                                                       REPEAT
REPEAT
                                                                                                                                                              REPEAT
REPEAT
                                                                                                                                                                                          DOMAIN
REPEAT
                                                                                                                                                                                                                                                                                                                                                          the European Bioinformatics Institute. There are no rest
use by non-profit institutions as long as its content
modified and this statement is not removed. Usage by an
                                                                                                                                                                                                                                                                                                                                                                                                                    This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rickettsia rickettsii.
                                                                 REPEAT
REPEAT
                                                                                                                                                                                                                                                             pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                                                                                                                                                                                                                             entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -1- SUBCELLULAR LOCATION: CELL WALL. THIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Infect. Immun. 58:2760-2769(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=90354033; PubMed=2117568;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         538
                        REPEAT
REPEAT
                                                                                                                                                    REPEAT
                                                                                                                                                                                                                       CHAIN
                                                                                                                                                                                                                                    SIGNAL
                                                                                                                                                                                                                                                 Antigen;
                                                                                                                                                                                                                                                                                                      EMBL; M31227; AAA26380.1; -.
                                                                                                                                                                                                                                                                                                                                 or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   508 AGYGSTQTS--
                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                               SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                            S-LAYER WITH HEXAGONAL SYMMETRY. PTM: GLYCOSYLATED (PROBABLE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GXSASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -IATAGLXQAYLPGKSMMAIGGXTYXGEAGYAI--GYSSISXXGNWXIKGTASGNSRGHF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSTGTAGHE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LIAGYGSTQTSGSDSSLTAGYGSTQTAQQGSVLTSGYGSTQTAG-
                                                                                                                                                                                                                                                                                         A41477; A41477
                                                                                                                                                                                                                                                                                                                                                                                                                    SWISS-PROT entry is copyright. It is produced through
                                                                                                                                                                                                                                                                                                                                                                                                      the Swiss Institute of Bioinformatics
                                                                                                                                                                                                                                                 Repeat;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                   Signal;
                                                                                                                                                                              1180
286
358
                                                                                                                                                                                                                       2249
                                                  949
1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Last sequence update)
Last annotation updat
n A precursor (190 kDa
p A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                    Cell wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -GSESSLTAGYGSTQTAREGSTLTAGYGSTGTAGADSS
₩,
                                                                                                           отн
                                                                                                                                                                                                          OUTER MEMBRANE PROTEIN A.
13 X APPROXIMATE TANDEM REPEATS
              TYPE
                                                                                                                                                                                                                                       POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                              TYPE
(TYPE
                                          (TYPE
                                                     (TYPE
                                                                    (TYPE
                           (TYPE
I (INCOMPLETE).
A9D6646C089DF087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ion update)
(190 kDa a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2249
                                                    S-layer; Glycoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Regnery R.L.;
la rickettsii has tandemly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  antigen) (Cell surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                         and
  CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \mathbf{S}
                                                                                                                                                                                                                                                                                                                                                                                          restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AASNLTTGY
                                                                                                                                                                                                                                                                                                                                                                   and
                                                                                                                                                                                                                                                                                                                                                                                                          EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                         ۵
                                                                                                                                                                                                                                                                                                                                                                   for
                                                                                                                                                                                                                                                                                                                                                                                                             collaboration
C outstation -
                                                                                                                                                                                                                                                                                                                                                                                in
                                                                                                                                                                                                                                                                                                                                                                in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         55
```

SETERE TERESTER TO DESCRIPTION OF THE PROPERTY OF THE PROPERTY

Local

Similarity

19.78;

Pred. No. 0.28;

```
RESULT 8
HLYA_SERMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  뮻
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Best Loc
Matches
7
                                                                                                                                                                                                                                                                                                                                                             01-APR-1990
01-APR-1990
01-NOV-1990
           the
                       between
                                    This
                                                                                                                                                                                                            MEDLINE=88257037; PubMed=3290200; Poole K., Schiebel E., Braun V.;
                                                                                                                                                                                    marcescens.";
                                                                                                                                                                                                "Molecular characterization of the
                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                               NCBI_TaxID=615;
                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                       Serratia marcescens
                                                                                                                                                                                                                                                                                                                                               Hemolysin precursor
                                                                                                                                                                                                                                                                                                                                                                                                      £15320;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        264
                                                                                                                                       Bacteriol 170:3177-3188(1988).
- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT
                                                        SUBCELLULAR LOCATION: Outer membrane. SIMILARITY: TO P.MIRABILIS HEMOLYSIN (HPMA).
                                                                                                  FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. SH
                                                                                        REQUIRES SHLB FUNCTION.
                                                                                                                                 DEFINED
                  SWISS-PROT entry is copyright. It is produced through a collaboration en the Swiss Institute of Bioinformatics and the EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                 SERMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AIDNTGNANNGI----VTFTGNSTVTGNV-GNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GXTYXGEAGYAIGYSSISXXGNWXIKGTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NLNGALSQVTGDIGNTNSLATISVGAGTATLGGAVIKATTTKLTDAASAVKFTNPVVVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NLNNXIDNVXG-----NARAGIAQAIATAGLXQAYLPGKS------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NSLATISVGAGTATLGGAVIKATTTKLTNAASVLTLTN-ANAVLTGAIDNTTGGDNVGVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAIDSTGNANNGIVTFTGNSTVTGDIGNTNALATVNVGAGTATLGGAVIKATTTKLTNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTKLTDAASAVKFTNPVVVTGAIDNTGNANNGIVTFTGNSTVTGDIGNTNSLATISVGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TEKLSFXANXXK-----VNIXSDTKGLNFAKXTAXTNGDXTVHLNGIGSTLTDXLXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FSSVSLGAGADAPTLSVDXXXALNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGV-AQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GAVIKATTTKLTNAASVLTLT-NANAVLTGAVDNTTGGDNVGVLNLNGALSQVTGDIGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSSGKVISGNVSPSKGKMDETVNINA------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SYLTLTNANAVLTGAIDNTTGGDNYGYLNLNGALSQYTGDIGNTNSLATISYGAGTATLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EVIDAVNKAGWRMKTTTAN----GQTGQADKFETVTSGTXVTFASGXGTTATVSK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKLVTGKXKXENXSSTDXGEGLVTAK 323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TATLGGAVIKATTTKLTNAASVLTLTNANAVLTGA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     XAXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKXGXTXXXXXNVDFVXTYDTVEFLS 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LNGALSQYTGDIGNTNSLATISYGAGTATLGGAYIKATT--TKITNAVSAYKFTNPYVYT
                                                                                                                                                                                                                                                                                                                                                         (Rel. 14, Created)
(Rel. 14, Last sequence update)
(Rel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
         Bioinformatics
                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                      AND SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----DDQG--NITVXYDVNVGDALNVNQLQNSGWNLDSKAVA
                                                                                                                                                                                                                                                                                                       gamma
        Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       52;
                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                       subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                     QF
                                                                                                                                                                                               hemolysin
                                                                                                                                                                                                                                                                                                                                                                                                               1608
                                                                                                                                                                                                                                                     31 - 40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1025
     There
                                                                                                                                                                                                                                                                                                                                                                                                               A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GNNIEIXR-NGKNIDIATSMXPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     267;
                                                                                                                                                                                               determinant
                                                                                                                                                                                                                                                                                                       Enterobacteriaceae;
       are
       no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --IDNTTGGDNVGVLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
       restrictions
                                                                                                                                                                                               of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  93;
                                                                                                                                           CLEARLY
                                                                                                                                                                                               Serratia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -MMAIG
                                                                                                                                                         BLOOD
                                                                                                   SHLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         699
       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15;
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                    RESULT 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local :
                                                                                                                                                                                                                  P20469;
01-FEB-1991 (Rel. :
01-FEB-1991 (Rel. :
16-OCT-2001 (Rel. :
FEBS Lett. 258:297-300(1989).
-:- FUNCTION: ICE NUCLEATION PROTEINS ENABLE CRYSTALLIZATION IN SUPERCOOLED WATER.
                                                                MEDLINE=90092494; PubMed=2599095; Abe K., Watabe S., Emori Y., Watar and I.c. nucleation active gene of an ice nucleation active gene of
                                         to those of Pseudomonas species nucleation activity.";
                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                              Bacteria;
                                                                                                                                                                            Pantoea ananas (Erwinia uredovora)
                                                                                                                                                                                                      Ice nucleation protein
                                                                                                                                                                                                                                                                                                                                         1380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1183
                                                                                                                                    NCBI_TaxID=553;
                                                                                                                                                      Pantoea
                                                                                                                                                                                             INAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                1279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            use by non-profit institutions as long modified and this statement is not removed entities requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                    ICEA_PANAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hemolysis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; M22618; AAA50323.1; -. PIR; A28182; A28182.
                                                                                                                                                                                                                                                                                                                                                                540
                                                                                                                                                                                                                                                                                                                                                                                                                     491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     258
                                                                                                                                                                                                                                                                                                                                    DAGLSHSNDPGSSITSKLSKVGTPRYAGKVKEKLEAG 1416
                                                                                                                                                                                                                                                                                                                                                                TAGLXQAYLPGKSMMA----IGGXTYXG-----EAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                            NINAGNNIEIXRNGK--NIDIATSMXPQFSSVSLGAGADAPTLSVDXXXALNVGSKXXNK 490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ANGINVNVKKDA----IYQGTALNGGRGKTAVNAGGDIRLD--
                                                                                                                                                                                                                                                                                                                                                                                        ---TTHANTGITAGDVTLNSGKDTRLAGARVDADSVQGKVGGDLHVESRKDVENGVKVDV 1379
                                                                                                                                                                                                                                                                                                                                                                                                                 PVRITNVAPGVKEGDVT----NVAQLKGVAQNLNNXIDNVXGN----
                                                                                                                                                                                                                                                                                                                                                                                                                                            GIKAN-----AKGGQTFNKDAGGKVDP-----NTGKDTHTLG----AGLKVGVEQQDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----DGKVTLSANGKGDDALHLQGAKVSG----GSAALEAKNGGILLESAKNEQHKDNWSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IDLGAGSSDSKE-----KTGGNL---SAGGAFDIAKVNESATERQGATIAS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVE-LKAGRDLTLQGTDVKSQGDVSLSAGNKVALQAAESTQTRKESKL-----SGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TVEFLSADTKTTTVNVESKDNGKXT----EVKIGAKTSVIKEKDGKLVTGKXKXENXSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXVTFASGXGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       XXXRAASXKDVLNAGWNIK-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -QASDKQSESRSGFNVKASAKGGFTADSKNFGAGFGGGTHNGESSSSTAQVGNISGQQ 1132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                 Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      31
1608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Toxin; Outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AΑ;
                                                                                                                                                                                                                  17, Created)
17, Last sequence up
40, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5.1%;
20.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      165078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           membrane;
                                                                                                                                                                gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   55;
                                                      Watanabe M.,
one of Erwinia
lies and region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Œ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 126.5; |
Pred. No. 0.23
55; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HEMOLYSIN
                                                                                                                                                                subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   D669B476FE7DAD51 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Signal
                                                   abe M., Arai S.;
Erwinia ananas. S
1 regions require
                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                  update
                                                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         . Usage by and for commercial http://www.isb-sib.ch/announce/
                                                    nanas. Sequence
required for ic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -GVKXGXTXXXXXNVDFVXTYD
               BACTERIA
                                                                                                                                                              Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels 127;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 1608
                                                                                                                                                                                                                                                                                                                                                                                                                   ARAGIAQAI---A
               ō
               NUCLEATE
                                                                    similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    st
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      in no way commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20;
```

```
RESULT 10
SLAP_CAMFE
ID 25AP_C
AC p35827
DT 01-JUN
DT 01-OCT
DE S-laye
GN SAPA.
                                                                                                                                                                                  Q
                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                            ρy
                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 88
             SLAP_CAMFE
P35827;
01-JUN-1994
01-JUN-1994
01-OCT-1994
S-layer prot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        use
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; IPR000258; Ice_nucleatn.
Pfam; PF00818; Ice_nucleation; 69.
PRINTS; PR00372; ICENUCLEATI.
PROSITE; PS00314; ICE_NUCLEATION; 49.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ice nucleation; Repeat; Outer membrane.

OMAIN 162 1281 OCTAPEPTIDE PERIODICITY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HSSP; P06620;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             329
                                                                                                                                                              659
                                                                                                                                                                                                                     909
                                                                                                                                                                                                                                                                              559
                                                                                                                                                                                                                                                                                                           478
                                                                                                                                                                                                                                                                                                                                        501
                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                               463
                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181 TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 s SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - Buropean Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SUBCELLULAR LOCATION: Outer membrane (By similarity).
DOMAIN: CONTAINS MANY IMPERFECT REPEARS OF THE CONSENSUS
OCTAPEBTIDE A-G-Y-G-S-T-X-T; FURTHER ON A 16-RESIDUE AND
REGIONAL 48-RESIDUE PERIODICITY IS SUPERIMPOSED.
SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION PROTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S07053; S07053.
                                                                                                                                                             GYGSTQTAGY
                                                                                                                                                                                        HFGXSASVGY
                                                                                                                                                                                                                                                                                                                                      GSTQTAGYGSTLTAGYGST-QTAQNESDLITGYGSTSTAGANSSLIAGYGS-TQTASYNS
                                                                                                                                                                                                                                                                                                                                                                                               SLIAGYGSTQTAQKG--SDLTAGY-----
                                                                                                                                                                                                                                                                                                                                                                                                                            TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSTGTAGDDSSLIAGYGSTQTAGEDSSLTAGYGSTQTAQKGSDLTAGYGSTGTSGADSSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                     SSLIAGYGSTQTAGYNSILTAGYGSTQTAEEGSDLTAGYGSTSTAG--
                                                                                                                                                                                                                                                 AIATAGLXQAYLPG-KSMMAIG-GXTYXGEAG--YAIGYSSISXXGNWXIKGTASGNSRG
                                                                                                                                                                                                                                                                                                      XXALNVGSKXXNKPVRITNVAPGVKEG-DVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQ
                                                                                                                                                                                                                                                                                                                                                                  VSPSKGKMDETVNINAGNNIEIXRNGKNIDI---ATSMXPQFSSVSLGAGADAPTLSVDX
                                                                                                                                                                                                                                                                                                                                                                                                                                                         IAGYGSTQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              X17316; CAA35194.1;
             protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1322 AA;
                           (Rel. 29, Created)
(Rel. 29, Last sequence update)
(Rel. 30, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 I NA
                                                                                       STANDARD;
                                                                                                                                                                                        602
                                                                                                                                                              899
               (Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             131094 MW; 89B0EE24AA837039 CRC64;
               array
                                                                                                                                                                                                                                                                                                                                                                                                                                                         TAGE -- ESTQTAGYGSTQTAQKGSDLTAGYGSTGTAGDDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 124;
Pred. No. 0.
                                                                                                                                                                                                                                                                              -REGSDLTAGYGSTGTAGSDSSIIAGYGSTSTAG-AD
             protein)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                       933
                                                                                                                                                                                                                                                                                                                                                                                                -----GSTSTAGYESSLIAGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . 28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB
                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1; Length 1322;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     192;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AQKGSDLTAGY - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROTEIN
                                                                                                                                                                                                                     -ADSSLIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    in no way
                                                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240
                                                                                                                                                                                                                    658
                                                                                                                                                                                                                                                                                                           536
                                                                                                                                                                                                                                                                                                                                      558
                                                                                                                                                                                                                                                                                                                                                                   477
                                                                                                                                                                                                                                                                                                                                                                                                                                                         462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                  592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     17;
```

```
Qy
                                                                                                                                       Š
                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                               밁
                                                                                                                                                                      DЪ
 멍
                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Cell wall; S-layer.
SEQUENCE 933 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              J. Biol.
[2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=90354448; PubMed Blaser M.J., Gotschlich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Campylobacter.
NCBI_TaxID=196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Campylobacter fetus.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         structure."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; J05577; AAA23032.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=91035477; PubMed=2229082;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ERRATUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Surface array protein of Campylobacter
746
                             534
                                                         691
                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                         315
                                                                                                                                                                                                                                                                                     500
                                                                                                                                                                                                                                                                                                                  255
                                                                                                                                                                                                                                                                                                                                              440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ween the Swiss Institute of Bioinformatics European Bioinformatics Institute. There a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUBCELLULAR LOCATION: CELL WALL. THIS S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                            TYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKLVTGKXKXENXSSTD
                                                                                                                                                                                                                                                                                                                                              TAAIDIKSASTLNLINSSVNGPKHLYSSKRRYCKFKRAAAKVKLNTTAATDQTVTLKANA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SWISS-PROT entry is copyright. It is produced through a collaboration
 MQITLGHAGTAGTDYSKVSMIDASAL ---
                             IAQAIATAGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNS
                                                                                                               TTLTINKDQVI-----NFTAADAGSVKLITVKLN---DVTALMIVVKIVLDAAAKD--
                                                                                                                                        ETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXALNVGSKXXN
                                                                                                                                                                      VIDAPGNDTIAMKSAALTSANFTMIKNIENVAISDAVATADLSSSAFKNSVIITTKEAAD
                                                                                                                                                                                                 --DDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAG---SSGKVISGNVSPSKGKMD
                                                                                                                                                                                                                              ----TTAFNALQSV------SFGKTGQGGKF-SVKTGTGDDKIEFVGTTLTEGS
                                                                                                                                                                                                                                                        XGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXVTFASGXGTTATVSK 374
                                                                                                                                                                                                                                                                                       TDNSLEFDSATAKTTSVT--ASGSGKTLVIK-GAEVETLVNID---
                                                                                                                                                                                                                                                                                                                                                                         TXXXXXRAASXKDVLNAGWN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Chem.
                                                         TNIALGTAAADKALVIDTGIETLNITSLVKATSPETTANTVNAKLTDVTSIIIDG
                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             265:14529-14535(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PubMed=2387868;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            96757 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AND
                                                                                                                                                                                                                                                                                                                                                                                                                  4.9%; Score 123.5;
21.6%; Pred. No. 0.2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         epsilon
                                                                                                                                                                                                                                                                                                                                                                                                      49;
                                                                                   --VTNVAQL-----KGVAQNLNNXIDNVXGNARAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            F88C729B4BA5B1E9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          subdivision; Campylobacter group;
                                                                                                                                                                                                                                                                                                                                                                          ----IKGVKXGXTXXXXXNVDFV--X
  KAGLTFDASAITLGANATIKGGSGADS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           fetus. Cloning
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                 DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and the
                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \mathbf{SI}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL
                                                                                                                                                                                                                                                                                                                                                                                                      99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ВУ
                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                             489
                                                                                                                                                                                                                                                                                                                   314
                                                                                      533
                                                                                                                690
                                                                                                                                                                                                    429
                                                                                                                                                                                                                              582
                                                                                                                                                                                                                                                                                       539
                                                                                                                                                                       642
                                                                                                                                                                                                                                                                                                                                                                                                        15;
```

FIBP\_ADE05
ID FIBP\_ADE05
AC P11818;

STANDARD;

PRT;

581

₹

RESULT

```
DЬ
                                                                                                          Š
                                                                                                                                   망
                                                                                                                                                                                                                                                     δÃ
                                 밁
                                                       δÃ
                                                                                                                                                           20
                                                                                                                                                                                      Query Match
Best Local S
Matches 72
Ŷ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-OCT-1989
01-OCT-1989
01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=oov, .... Jacrot B.;
Chroboczek J., Jacrot B.;
"The sequence of adenovirus "The sequence of adenovirus"
                                                                                                                                                                                                                                                                                                                                                                                              EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Crystal structure of the receptor-binding domain 5 fiber protein at 1.7-A resolution."; Structure 2:1259-1270(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Chroboczek J., Bieber F., Jacrot B.; "The sequence of the genome of adenovirus with the genome of adenovirus type 2."; Virology 186:280-285(1992).
                                                                                                                                                                                                                                                     Fiber protein; 3D-structure.
SEQUENCE 581 AA; 61584 MW
                                                                                                                                                                                                                                                                           InterPro; IPR000939; Adeno_fiber2
InterPro; IPR000978; Adeno_fiber_
InterPro; IPR000931; Adeno_fibre.
Pfam; PF00541; adeno_fiber; 1
Pfam; PF00608; adeno_fiber2; 7
Pfam; PF00608; ADENOVSFIBRE.
                                                                                                                                                                                                                                                                                                                                                         PDB; 1KNB; 31-MAR-95.
GlycoSuiteDB; P11818; -
                                                                                                                                                                                                                                                                                                                                                                                                                                  or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                           use by non-profit institutions as long as modified and this statement is not removed. (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          between serotypes 2 and 5."
Virology 161:549-554(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Viruses; dsDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Human adenovirus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -!- FUNCTION: RECOGNIZES THE CELL
BETWEEN THE ADENOVIRUS CAPSID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         X-RAY CRYSTALLOGRAPHY (1.7 ANGSTROMS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=92087470;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPLETE GENOME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
MEDLINE=88072096; PubMed=3686830;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=28285;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Xia D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=95219386;
      415 KVISGNVSPSKGKM-DET-VNINAGNNIEIXR
                                 257
                                                                                   197
                                                                                                             340
                                                                                                                                     153
                                                                                                                                                           282 TEVKIGAKTSVIKEKDGKLVTGKXKXENXSSTDXGEGLVTAK-EVIDAVNKAGWRMKTT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBUNIT: HOMOTRIMER.
                                                                                                                                                                                                                                                                                                                                                                                  A27404;
                                                                                 YTQNGKLGLKYGAPLHYTDDLNTLTVATGPGVTINNTSLQTKVTGALGFDSQGNMQLNVA
                                                                                                                                   SEGKLALQTS --
                                 GGLRIDSQNRRLILDVSYPFDAQNQLNLRLGQGPLFINSAHNLDINYNKGLYLFTASNNS
                                                                                                           -TANGQTG---
                                                                                                                                                                                                                                                                                                                                                                                             M73260; -; NOT_ANNOTATED_CDS.
M18369; AAA42504.1; -.
                                                                                                                                                                                      Similarity 72; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Henry L.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                  s requires a license agreement (See http://www.isb-sib.
an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (Rel.
(Rel.
(Rel.
                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                   ERADF5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             viruses,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PubMed=7704534;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PubMed=1727603;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12,
12,
35,
                                                       ITVXYDVNVGDALNVNQLQ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gerard R.D.,
                                                                                                                                                                                                                                                     61584 MW;
                                                                                                                                                                                                                                                                                                                              Adeno_fiber2.
Adeno_fiber_knob.
                                                                                                                                                                                                  4.9%;
                                                                                                          ·QADKFETYT--SGTXVTF---ASGXGTTATVSKDDQGN-----
                                                                                                                                     GPLTT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
Last sequence
Last anno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ņ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence update)
annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fiber:
                                                                                                                                                                                     Score 122.5; DB 1;
Pred. No. 0.14;
1; Mismatches 89;
                                                                                                                                                                                                                                                   C3FDDFCF9E5E599F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             stage;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Deisenhofer J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RECEPTOR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   similarities and
                                                                                                                                   -TDSSTLTITASPPLTTATGSLGIDLKEPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Adenoviridae; Mastadenovirus
                                                       NSGWNLD---SKAV----AGSSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TSOH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SERVES
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CELL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ഗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             and
                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of adenovirus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \mathbf{A}\mathbf{S}
      NGKNIDIATSMXPQ 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                             γd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RECEPTOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   differences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              THE LIGAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                             and
                                                                                                                                                                                                              581;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             compartson
                                                                                                                                                                                                                                                                                                                                                                                                                                                     is
for
                                                                                                                                                                                                                                                                                                                                                                                                                                               .ch/announce/
                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                             commerci
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   type
                                                                                                                                   196
                                                       414
                                                                                  256
                                                                                                           379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         no
                                                                                                                                                                                      16
```

```
δÕ
                                       B
                                                             8
                                                                                        Вр
                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                           Matches
                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B_RICJA
OMPB_RICJA
                                                                                                                                                                                                          CHAIN
DOMAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rompB)
(romp B) (Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptidel
                                                                                                                                                                                                                                                                                                                                                                                                                                                           <del>:</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     006653;
                                                                                                                                                                                                                                                  CHAIN
                                                                                                                                                                                                                                                               Antigen;
                                                                                                                                                                                                                                                                                                                             or send
                                                                                                                                                                                                                                                                                                                                                       use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                               the
                                                                                                                                                                                                                                                                                                                                                                                                                                      -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (MAY-1997)
-i- FUNCTION: THE 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Sequencing japonica.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Uchiyama
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-YH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=35790;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Proteobacteria; alpha subdivision; Rickettsiales; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rickettsia japonica.
                                                                                                                                                                                                                                                                           InterPro; IPR003858; rOmpA_rOmpB.
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                                                                                                                                                                                                                            entities
                                                                                                                                                                                                                                                                                                                                                                                              between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16-OCT-2001
             349
                                       502
                                                               307
                                                                                         442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   317
                                                                                                                                                                                                                                                                                                                                                                s SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FUNCTION: THE 32 KDA
                                                                                                                                                                                                                                                                                                                                                                                                                                   SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         (BY SIMILARITY).
SUBCELLULAR LOCATION: CELL WALL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nitted (MAY-1997) to the EMBL/GenBank/I FUNCTION: THE 120 KDA SURFACE-EXPOSED STRUCTURAL PROTEIN WHICH MAY PLAY A RO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VIRULENCE FACTOR AND/OR IMMUNOGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                LAYER WITH HEXAGONAL
             DKFETVTSGTXVTFASGXGTTATVSKDDQGNITVXYDV-----
                                                                                                                 TVEFLSADTKTTTVN----VESKDNG-----KXTEVKIGAKTSVIKEKDGKLVTGKXK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KKLEVNLSTAKGLMFDATAIAINAGDGLEFGSPNAPNTNPLKTKIGHGLEFDSNKAMVPK
                                     QTVLVGGVLAAGAITLDGSATITGDIGNGGGGAALQSITLANDA---TKTLTLGGAN---
                                                                                        TLASASADANVAVTNNITAIEASGVGVVQLSGTHTAELRLGNAGSVFKLADGTVINGKVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FSSVSLGAGADAPTLSVDXXXALNVGSKXXNKPVRITNVAP
                                                                                                                                                                                                                                                                                                      AB003681;
                                                                                                                                          l Similarity
92; Conserv
                                                                                                                                                                                                                                                                                                                             an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                             S-layer;
                                                                                                                                                                                                                                                                                                                                           requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LGTG---
                                                                                                                                                                                                                       1339
528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (Rel. 39, Rel. 39, Rel. 39, Rel. 40,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            of the gene encoding the protein rOmp B
                                                                                                                                           Conservative
                                                                                                                                                                                                           AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                      BAA20138.1;
                                                                                                                                                                                                                       1338
1656
533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -- LSFDSTGAITVGNKNNDKLTLWTTPAP
                                                                                                                                                       4.98;
22.98;
                                                               NXSSTDXGE---
                                                                                                                                                                                                           168097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Last sequence u
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                               wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                  SYMMETRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BETA
                                                                                                                                          51;
                                                                                                                                                                                                            Œ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL/GenBank/DDBJ
                                                                                                                                                       Score 122.5; D
Pred. No. 0.45;
                                                                                                                                                                                                                       32 KDA BETA PEPTIDE. POLY-GLY.
                                                                                                                                                                                                                                                  120 KDA SURFACE-EXPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                           Mismatches
                                                                                                                                                                                                           3132A69C9DD5999F CRC64;
                                                             -GLVTAKEVIDAVNKAGWRMKTTTANGQTGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1656
                                                                                                                                                                                                                                                                                                                                                                                                                                                             THIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Y A ROLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MAY SERVE AS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                               There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A
<del>..</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DDBJ databases.
PROTEIN IS A MAJOR
OLE AS A RICKETTSIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                             BACTERIUM
                                                                                                                                                                     DB
                                                                                                                                           161;
                                                                                                                                                                                                                                                                                                                                                        Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            499
             NVGDALNVNQLQNSG
                                                                                                                                           Indels
                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A MEMBRANE
                                                                                                                                                                                                                                                                                                                                                        γď
                                                                                                                                                                                                                                                                                                                                                                                                                                                             \mathbf{S}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of Rickettsia
                                                                                                                                                                                                                                                  PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                             COVERED
                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                     1656;
                                                                                                                                           97;
                                                                                                                                                                                                                                                                                                                                                          for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                        commercial
              401
                                                                                         501
                                                                                                                   306
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      376
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŵ
                                                                                                                                           23;
```

This

between

the European Bioinformatics Institute.

SWISS-PROT entry is copyright. It is produced through a collaboration en the Swiss Institute of Bioinformatics and the EMBL outstation -

There are no restrictions

on.

```
RESULT 13
OMPA_RICCN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OMPA_RICLN

052657; P95591; P95592,

052670; 052674;

T 16-OCT-2001 (Rel. 40, Created)

OT 16-OCT-2001 (Rel. 40, Last sequence update)

OT 01-MAR-2002 (Rel. 41, Last annotation update)

OT 01-MAR-2002 (Rel. 41, Last annotation update)

On-ther membrane protein A precursor (190 kDa a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                  MEDLINE-21442074; PubMed-11557893;
Ogata H., Audic S., Renesto-Audiffren P., Fournier P.-E.,
Samson D., Roux V., Cossart P., Weissenbach J., Claverie C
Raoult D.;
                                  "Differentiation of spotted fever group ric
analysis of restriction fragment length pol-
DNA of the gene encoding the protein rompa.
J. Clin. Microbiol. 34:2058-2065(1996).
                                                                                                                                                                                                                        SEQUENCE OF 8-204 FROM N.A. MSTRAIN-Indian tick typhus, M1, Ma MEDLINE-97015921; pubMed-8862558; Roux V., Fournier P.E., Raoult D.
                                                                                                                                                                                                                                                                                                                                                                                                               "Sequence analysis of the 190-kDa antigen-encoding conorii (Walish 7 strain).";
Gene 140:115-119(1994).
                                                                                                  STRAIN-Indian tick typhus, M1, Malish 7, and I Raoult D., Fournier P.E., Roux V.; "Phylogenetic analysis of spotted fever group"
                                                                                                                                                                                                                                                                                          Science
                                                                                                                                                                                                                                                                                                                                                                         STRAIN-Malish
                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rickettsiaceae;
NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria; alpl
Rickettsiaceae; Rickettsieae;
                                                                                          of the
                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE-94171067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rickettsia conorii
                                                                                                                                                                                                                                                                                         "Mechanisms of evolution in Rickettsia Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             664
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVKFLGNATFNGNTTIAAN-STLQISGNYTADFIASADGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IDIATSMXPQ----FSSV-----SLGAGADAPTLSVDXXXALNVGSKXXNKPVRITNVAP | |: | |: | : : : : | || || : ||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WNLDSKAVAGSSGKVISGNVSPSK---GKMDETVN----IN---AGNN--IEIXRNGKN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---IISANGGTINFQANGGTIKLTS--TQNNIVVDCDLAIATDQTGVVDASSLT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GVNL-YATNITTTDA---NVGSFVFNAGGKNIVSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GVKEGDVTNVAQLKGVAQNLNNXIDNVXG-NARAGIAQAIATAGLXQ------AYLPGK 551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ITRTTNAAGQGKIIFNPVVNNNTTLAAGTNLGS-AANPLAEINFGSKGARADT-VLNVGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -NAQTLTISGTIGIIGANNTTLGQFNIGSSKTTLNGGNVAINELVIGNNGSVQFAHNTYL
         GLYCOSYLATED (BY SIMILARITY)
LARITY: BELONGS TO THE RICKET
                                                                                                                                          953-2012 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                              7. A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PubMed=8125327;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;
P95593; P95594; Q52667;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                         D.;
                                                                                                                                                                                                                                                  Malish 7,
           RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ion update)
(190 kDa aı
                                                                                                                                                                                                                                                                                                       conorii
                                                                                                                                                                                 polymorphism npA.";
                                                                                                                                                                                              rickettsiae by sequencing and polymorphism of PCR-amplified
                                                                                                                                                                                                                                                    and Moroccan;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----TVGGQQGNKFNTVALDNGT
                                               BACTERIUM IS COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   antigen)
                                                                                                                               Moroccan;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rickettsiales;
                                                                                                      rickettsiae
                                                                                                                                                                                                                                                                                                       and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q52668; Q52669;
                                                                                                                                                                                                                                                                                                      ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                        gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (Cell surface
                                                                                                                                                                                                                                                                                                      prowazekii.";
                                                                                                                                                                                                                                                                                                                                                                                                                                         of Rickettsia
                                                                                                                                                                                                                                                                                                                                J. -M.
                                                                                                                                                                                                                                                                                                                                            Barbe
                                                                                                      λą
                                                                                                      study
                                                 ВY
                                                                                                                                                                                                                                                                                                                                              ۲,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                663
```

```
$\text{Square}$ \text{Square}$ \text
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; U01028; EMBL; AE00867; AE00867; U43794; EMBL; U43798; EMBL; U43806; EMBL; U43806; EMBL; U46918; AEMBL; U83440; AEMBL; U83443; AEMBL; U83453; AEMBL; U83448; AEMBL; U834453; AEMBL; U83453; AEMBL; U83448; AEMBL; U83448; AEMBL; U83448; AEMBL; U834453; AEMBL; U834453; AEMBL; U83453; AEMBL; U834545; AEMBL; U834545; AEMBL; U83455; AEMBL; U83455; AEMBL; U83455; AEMBL; U83455; AEMBL; U83455; AEMB
                                                                                                                                            CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
CONFLICT
                                                                       CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                          CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
DOMAIN
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                               CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pfam;
                                    CONFLICT
                                                   CONFLICT
                                                                                                                            CONFLICT
                                                                                                                                                                                                                                      CONFLICT
                                                                                                                                                                                                                                                           CONFLICT
                                                                                                                                                                                                                                                                                                                                                 CONFLICT
                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AE008674;
U43794; AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PF02708; rOmpA_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Repeat;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IPR003858; rOmpA_rOmpB
2708; rOmpA_rOmpB; 1.
                 1009
1013
11182
1314
1314
11624
11628
11672
11872
11875
11878
11878
11878
                                                                                                                                                                                                                                                                          908
985
985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; AAA17405.1; -.
;74; AAL03811.1; -.
; AAB49549.1; -.
; AAB49550.1; -.
                                                                                                                                                                                                                                                                                                                                                   640
669
793
803
809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 126
137
157
368
374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAA86663.1;
AAC35176.1;
AAC35179.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAC35189.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAB49566.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAB49551.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAC35184.1;
                 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Signal;
                                    898
908
985
1003
1182
11314
11451
11624
11622
11875
11875
11875
11875
11875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1308
1877
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 38
2021
946
1528
60
76
137
133
954
                                                                                                                                                                                                                                                                                                                                                                                                                                                               10
92
126
137
157
369
388
                 203328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pB; 1.
Cell wall; S-layer; Glycoprotein;
MS -> LP (IN REF.
E -> A (IN REF.
MTAPLP -> ITPPLS
G -> R (IN REF.
B MW; 327FC42D7CB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                H > E G E Z X K F Z 7 D
                                                                                                                                                                                                                                                                                                                                                                                                         < z
' '
                                                                                                                                                                                                                                                                                                                                                                                                                                             REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     D ->
                                                                                                                                                                                                                                                                                                                                LLRVQGGVVKSNTIN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KATLGGAIIKATTTK ->
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AND MOROCCAN).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MISSING (IN STRAIN M1).
MISSING (IN STRAIN MOROCCAN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N -> NN (IN STRAIN INDIAN TICK TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OUTER MEMBRANE
THR-RICH.
                                                                                                                                                                                                                                                                                                                                                                    VN -> IS (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VT -> II (IN STRAIN INDIAN
                                                                                                                                                                                                                                                                                                                                                                                        ţ
                 >LP -> ITPPLS (IN 

> R (IN REF. 1). 

327FC42D7CB24668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               H (IN STRAIN MOROCCAN)
I (IN STRAIN INDIAN TH
                                                                                                               ש
                                                                                                                                                                                  z
                                                                                                                                                                                                       × 20 20 20 ×
                                                                                                                                                                                                                                                                                                                                                                                        ÐН
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       U
                                                                                                                                                                                                                                                                                                                                                               ).

(IN REF. 1).

I (IN REF. 1).

D (IN REF. 1).

TAN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N (IN REF.
D (IN REF.
VN (IN REF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A (IN STRAINS INDIAN TICK
                                                                                                                                                                                (IN
NI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (IN
                                                                                                           ΩIN
                                                                            REF. 1
N REF. 1
N REF.
IN REF.
(IN REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REF.
                                                                                                                                                                                REF.
                                                                                                                                                                                                                     REF.
REF.
                                                                                                                                                                                                                                                                          REF.
                                                             A REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EF. 1)
REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROTEIN
                                                                                                                                                                                                                                                                                                                                                   Ÿ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INDIAN TICK TYPHUS)
                                                                                                                                                                                                                                                                                                                                                   KATLGGAIIKATTTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LLQVQGGVVKANTIN
                   CRC64;
                                                       ٢
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TICK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               K TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (IN
                                                                                                                                                                                                                                                                                                                                                   (IN
```

Query Match Best Local S Matches 94

Similarity

4.9%; 22.2%;

Score 122.5; Pred. No. 0.

0.56;

DB 1;

94;

Conservative

44;

Mismatches

152;

Indels Length 2021;

133;

Gaps

```
RESULT 14
FLA2_CAMJE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        БР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
    ì
InterPro: IPR00109; Flagellin_C.
InterPro: IPR001492; Flagellin_N.
Pfam; PF00700; Flagellin_C; 1.
Pfam; PF00669; Flagellin_N; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P22251;
01-AUG-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1095
                                                                                                                                             This SWISS-PROT entry is copyright. It is produced through a collable between the Swiss Institute of Bioinformatics and the EMBL outst the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in
                                                                                                                                                                                                                                         flagellin genes.";
Biol. Chem. 265:17798-17804(1990).
-i- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN
-i- FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria; Campylobacter.
                                                                                                                                                                                                                                                                                                                                                                                                                        Campylobacter jejuni
                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-OCT-1996
16-OCT-2001
                                                                                                    entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                               use by non-profit institu
                                                                                                                                                                                                                                                                                               Nuijten P.J., van Asten F.J., Gaastra W., "Structural and functional analysis of tw
                                                                                                                                                                                                                                                                                                                                          STRAIN=81116;
                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Flagellin A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FLA2_CAMJE
                                                                          EMBL; J05635; AAA23024.1;
                                                                                                                                                                                                                                                                                                                        MEDLINE=91009243; PubMed=2211662;
                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=197;
                                                               PIR; A39228; A39228.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      359
                                                                                                                                                                                                                 SIMILARITY: BELONGS
                                                                                                                                                                                                                               SUBUNIT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LNIGSNVAG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LNAGWNIKGVKXGXTXXXXXNVDFV--XTYDTVEFLSADTKTTTVNVES-----KDNGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGGQALKLNFMNGGSVSGVV-----GTAANSVGDITTAGATSFA---SSVNAKGTATLGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VXGNA-RAGIAQAIATAGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VLGASNLNRVNGIAMLKVGAGNVT--IAKGGNVKIGEIQGTGTNTLTLPAHFKLTGSINK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KVISGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    XVTFASGXGTTATVSKDDQGNI----TVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NIDPDNDDEGIVILNSV-----TAG--KKLTIAGGKTFGGAHKLQDIVFKGEGDFGTAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----XGEGLVTAKEVIDAVNKAGWRMKTTTANGQT-GQADKFETV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FTSSTAFNAGTIQINDATYTIDANNGNLNIPAGNIKFAHADAQLILQNSSGNDRTITLGA 1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             XTE-----VKIGAKTSVIKEKDGKL--VTGKXK-----XENXSSTD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VDXXXALNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQN------LNNXIDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                587
                                                                                                                                                                                                                                                                                                                                                                                                                                                              (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (Rel.
                                                                                                                                                                                                                 HETEROPOLYMER OF FLAA AND FLAB.
TY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --- NTTNIVLDITGQLELGATTANVVLFKDAVQLTQTGNIGGFLDFNAKNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             34,
40,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        19, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----AARNIGDVGGNKFNTLLIYNAVTITDDVNLEGIQNVLINNNAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -TYTLN--NNVNVAGTVKNT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Last
Last
                                                                                                                                                                                                                                                                                                                                                                                                          epsilon
                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence update) annotation updat
                                                                                                                                  is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                          subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    575
                                                                                                                                                                                                                                                                                                                                                                                                                                                              update)
                                                                                                                                                                                                                                                                                                two
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
                                                                                                                                                                                                                                                                                                 van der Zeijst
o Campylobacter
                                                                                                                                  Usage
                                                                                                                                                                                                                                                                                                                                                                                                          Campylobacter group;
                                                                                                                                                                                                                                                          WHICH
                                                                                                                                  γd
                                                                                                                                                                                                                                                          POLYMERIZES
                                                                                                                                   and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGTNNGTLI
                                                                                                                                                                                                                                                                                                B.A.;
jejuni
                                                                                                                                                                         EMBL outstation
                                                                                                                                                                            a collaboration -
MBL outstation -
                                                                                                                                   for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TSGT
                                                                                                                                                                                                                                                           oT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          358
                                                                                                                                                no
                                                                                                                                              way
```

```
BERNALE PARA MER RESULT RANGE PARA RANGE R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DR
DR
FT
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Flagella.
INIT_MET
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRINTS; ProDom;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BIGA_SALTY STANDARD; PRT; 1953 AA. P25927; P25928; Q9XCQ3; 01-MAY-1992 (Rel. 22, Created) 01-MAR-2002 (Rel. 41, Last sequence update) 01-MAR-2002 (Rel. 41, Last annotation update) Putative surface-exposed virulence protein bigA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       _SALTY
                                                                                                                                                                                                                                                                                                                      Stojiljkovic I., Valentine P., "Salmonella typhimurium rhs ho Submitted (MAR-1999) to the EM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BIGA OR STM3478.
Salmonella typhimurium
Nature 413:852-856(2001).
[3]
SEQUENCE OF 1-765 FROM N.
                                                                                                                                                    MCClelland M., Sanderson K.E., Spieth J., Clifton S.W., Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., I
                                                                                                                                                                                                                            STRAIN-LT2 / SGSC1412 / ATCC 700720;
MEDLINE-21534948; PubMed-11677609;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=602;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria;
                                                                       "Complete
                                                                                                                Waterston
                                                                                                                                        Ryan
                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=14028;
                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Salmonella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     259 VEFLSADTKTTTVNVESKDNGKXT--EVKIGAKTS-VIKEKDGKLVTGK------
                                                                                                           E., Sun H., Florea L. rston R., Wilson R.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TAGVTTLKGAMAVMDIAETAITNLDQIRADIGSIQNQVTSTINN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVRITNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FSVGSGKNLSVGLSQGIQIISSAASMSNTYVVSAGSGFSSGSGNSQFAALKTTAANTTDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----GKNIDIATSMXPQFSS------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ISQSSVSLRESKGQISAT-NADAMGFNSYKGGGKFVFTQNVSSISAFMSAQGSGFSRGSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VISGNVS--PSKGKMDETVNINA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GVYAIKEGTTSQDFAINGVTIG-KIEYKDGDGNGSLISAINAVKDTTGVQASKDENGKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---TANGQTGQADKFETVTSGTXVTFASGXG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SFTSGVVGLTIKNYNGIEDFKFDNVVISTSVGTGLGALAEEINKSADKTGVRATYDVKTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        {\tt MEELDNIANTTSFNGKQLLSGNFTNQEFQIGASSNQTVKATIGATQSSKIGVTRFETGAQ}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LTSADGRGIKITGDIGVGSGILANQKENYGRLSLVKNDGRDINISGTNLSAIGM-GTTDM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PR00207; F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ---NITVXYDVNVGDALNVNQLQN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
575 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----APGVKEGDVTNVAQLKGVAQNLNNXIDNVXGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FLAGELLIN.
; Flagellin_C;
                                                                                                                                   Florea L., Miller W.,
                                                                                        sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----XKXEN-XSSTDXGEGL-VTAKEVIDAVNKAGWR----MKTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
59398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4.9%;
  N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MW;
                                                                                             of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                52;
                                                                                                                                                                                                                                                                                                                      homolog.";
EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BY SIMILARITY.
; 71F192EFD0AF0DC7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 122; DB 1;
Pred. No. 0.15;
                                                                                             Salmonella
                                                                                                                                                                                                                                                                                                                                                      , Heffron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -VSLGAGADAPTLSVDXXXALNVGSKXXNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNNIEIXRN---
                                                                                                                                                                                                                                                                                                                                                                         Ŧ
                                                                                                                                        Stoneking
                                                                                             enterica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                              databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  precursor
                                                                                                                                        Ŧ.,
                                                                                             serovar Typhimurium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SGWNLDSKAVAGSSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTATVSKDDQG----
                                                                                                                                          Nhan M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  575;
                                                                                                                                                                                , Latreille
1 S., Layman
                                                                                                                                                             Mulvaney
                                                                                                                                                                                     Layman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         297
                                                                                                                                                                                   ָס ָ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18;
```

```
Query Match
Best Local S
Matches 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AF133696; AAD39458.1; -
EMBL; AE008859; AALZ2340.1; -
EMBL; M64606; AAAZ7042.1; ALT
EMBL; M64606; AAAZ7043.1; ALT
EMBL; M64606; C39200.
PIR; C39200; C39200.
PIR; D39200; D39200.
                                                                                                                                                                                                                                                                                                                         CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                  REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOMAIN
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               StyGene; So
Virulence;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the European Bioinformatics Institute. There are no restrictions on use by non-profit institutions as long as its content is in no modified and this statement is not removed. Usage by and for commen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         J. Bacteriol. 173:325-333(1991).
-I- CAUTION: Ref.3 sequence differs in positions 414 and 732.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-91100301; PubMed-1987123; Wu J.Y., Siegel L.M., Kredich N.M.; "High-level expression of Escherichia requirement for a cloned cysG plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REPEAT
    456
                                                                                                                          360
                                                                                                                                                       282
                                                                                                                                                                                                     223 ASXKDVLNAGWNIKGVKXGXTXXXXXNVDFVXTYDTVEFL-SADTKTTTVNVESKDNGKX 281
                                 395
                                                               398
                                                                                                                                                                                     301
GTSDISG-----AGSTGTVIDGNNARVNNDGDMTIT-DGGTGGHITGDNVVIDNAGS
                            NQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIXRNGKNIDIATS
                                                                                                                                                     TEVKIGAKTSVIKEKDGKLVTG----KXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMK
                                                                                                                                                                                  ADGKTLNVTGWDVTDANAAVIEGTQEN-GLYWKYDSRGYLIIADDNTTVISGDDQAHNSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SWISS-PROT entry is copyright. It is produced through
sen the Swiss Institute of Bioinformatics and the EN
                                                                                          TTTANGQTGQADKFETVTSGTXVTFASGXGTTATVSKD----DQGNITVXYDVNVGDALNV
                                                                                                                       RGMDISG-----QDRTGVIISGDRTVNTLTGDSSVTDGATGMV---
                                                              -ISGDGTTNTISGHSTVDNATG-ALISGNGTTTNFAGDIAVSGGGTAIIIDGDNATIKNT
                                                                                                                                                                                                                                                 l Similarity
86; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SG10437; bigA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Repeat;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        101
101
104
114
123
                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                         1837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1953
                                                                                                                                                                                                                                                                                                                                                                                                                                  252
103
113
122
122
133
144
155
168
168
199
210
221
232
243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Signal;
                                                                                                                                                                                                                                                            4.9%;
                                                                                                                                                                                                                                                                                                                         200150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ALT_FRAME.
                                                                                                                                                                                                                                                                                                                      15 (INCOMPLETE).
D -> DRGDDDVTPPDD (IN REF. 1).
A -> R (IN REF. 3).
D -> N (IN REF. 1).
QYLE -> ITLQ (IN REF. 1).
SA -> T (IN REF. 1).
50 MW; 611B3F1C954D91AE CRC64;
                                                                                                                                                                                                                                                48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Complete proteome POTENTIAL.
                                                                                                                                                                                                                                                            Score 121.5; D
Pred. No. 0.63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   10.
12.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PROTEIN BIGA.
15 X 11 AA TANDEM REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PUTATIVE SURFACE-EXPOSED VIRULENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (INCOMPLETE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (INCOMPLETE)
                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          from that shown due
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     coli NADPH-sulfite reductase:
to overcome limiting siroheme
                                                                                                                                                                                                                                                                           DB 1;
                                                                                                                                                                                                                                                162;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Usage
                                                                                                                                                                                                                                                Indels 103;
                                                                                                                                                                                                                                                                            Length 1953;
                                                                                                                                                                                                                                                                                                                                                                                                    <u>.</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          frameshifts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               collaboration
                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 in no way
                              454
                                                                                                                                                                                   359
                                                            455
                                                                                          394
                                                                                                                       397
                                                                                                                                                                                                                                              19;
```

SOFT TO THE TEST T

δÃ В γ

Š В

멍

δÃ

망

```
Ş
                           Q
                                                           Вþ
                                                                                                                         В
                                                                                                                                                      Ş
밁
 585
                              569
                                                               553
                                                                                            509
                                                                                                                          507
                                                                                                                                                         455
DGAMGIITYG-----TGNEAKNTGNATVRDADSVGF 615
                                                               TGDI --
                                                                                VAQLKGVAQNLNNXIDNVXGNARAGIAQAIATAGLXQAYLPGKSMMAIGGXTYXGEAGYA 568
                             IGYSSISXXGNWXIKGTASGNSRGHFGXSA----SVGY
                                                                                                                         ----TTVS---GADATALYIEGDNALVINEGNQT-----ISGGAVGTRIDGDDAHTTN
                                                                                                                                                      MXPQFSSVSLGAGADAPTLSVDXXXAL--NVGSKXXNKPVRITNVAPGVK-EGD---VTN
                                                             -AVDGAGSAAVIINGDN----GSLTQAGDLLVT 584
                              602
                                                                                                                          552
```

Search completed: July Job time: 1197 sec ω, 2002, 08:30:26

```
Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence:
                                                                                                                                                                                                                             No
   5
6
7
8
9
110
                                                                                                                                                                                                                                                                                                                Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2231.5
2230.5
                                                                                                                                                                                                                         Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      length:
                                                                                                                                                                                                                         Match
                                                                                                                                                                                                                                                                                                                                                                                             10:
11:
12:
13:
14:
15:
16:
16:
17:
18:
19:
20:
21:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                             Query
 89.4
89.4
89.3
89.3
89.3
89.3
89.3
                                                                                                                                                                                                                                                                                                                                                                                  5: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1985.DAT: *
7: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1985.DAT: *
7: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1985.DAT: *
7: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DAT: *
8: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1989.DAT: *
8: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1989.DAT: *
10: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1989.DAT: *
11: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
12: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1993.DAT: *
13: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1993.DAT: *
14: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1993.DAT: *
15: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DAT: *
16: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
16: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
17: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
18: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
19: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
20: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
21: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
22: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-771-382-11
2499
1 MNXIXRIIWNSALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             July 3, 2002, 08:09:11; Search time 168.6 Seconds (without alignments) 397.916 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A_Geneseq_032802:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             747574 seqs, 111073796 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNXIXRIIWNSALNAWVXVS.....TASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1980.DAT:*
\SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1981.DAT:*
\SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1982.DAT:*
\SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1983.DAT:*
\SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1984.DAT:*
                                                                                                                                                                                                                           Length
 598
598
598
598
599
591
591
                                                                                                                                                                                                                             В
                                    2202220
                                                                                                                                                                                                                             ā
                   AAY23738
AAU06174
AAV23745
AAU06177
AAY23745
AAY23745
AAY23743
AAY27043
AAY23743
AAY277202
                                                                                                                                                                                                                                                                                 SUMMARIES
                                                                     A surface protein
N. meningitidis BZ
A surface protein
N. meningitidis H1
A surface protein
N. meningitidis P2
BASB029 amino acid
                                                                                                                                                                                                                       Description
                                    A surface
N. meningi
                   Amino
                                    surface protein
meningitidis H3
                 acid sequenc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          604
protein
```

Escherichia coli p	ABB52677	22	1778	11.9	298.5	C)
M. catarrhalis les	AAB69136	22	2314	12.0	301	44
isserial c	AAB37830	21	72	4.	361	ω
	AAB23859	21	1104	20.5	513	12
Haemophilus influe	AAB23856	21	1104	0	513	1
O.	AAB37832	21	116		546	Ö
	AAB23854	21	1002	۲.	558	39
S	AAB23857	21	1004	ω.	583	88
S	AAY27201	20	245	<u>ب</u>	634	37
influ	AAB23855	21	679	0.	54	36
	AAR99394	17	679	0.	754.5	35
influ	AAB23858	21	1094	ω.	825	34
	AAR99392	17	1098	5	880	33
	AAR99393	17	2353		917.5	32
Haemophilus influe	AAB23860	21	2411	6.	918.5	31
۳.	AAU06184	22	407	0	74	30
N. meningitidis PM	AAU06185	22	433	4.	8	29
N. meningitidis PM	AAU06182	22	512	84.0	2098	28
N. meningitidis H4	AAU06183	22	513	4.	2106.5	27
N. meningitidis PM	AAU06186	22	502	86.7	2166	26
Amino acid sequenc	AAY27203	20	592	87.7	2191	25
N. meningitidis H4	AAU06172	22	592	88.7	2216	24
A surface protein	AAY23744	20	592	8	2216	23
A surface protein	AAY23737	20	592	œ	2216	22
2	AAU06180	22	592	æ	2221	21
itidis	617	22	594	9.	2223	8
A surface protein	AAY23739	20	594	9.	2223	19
	AAU06181	22	604	9.	2229	8
N. meningitidis EG	AAU06174	22	594	89.2	2230	17
mino ac	AAY57044	21	594	9	2230	16
A surface protein	AAY23740	20	594	9	2230	15
N. meningitidis EG	AAU06175	22	591	9	2230.5	14
itidis	0617	22	591		2230.5	ū
A surface protein	AAY23746	20	591	89.3	2230.5	12

## ALIGNMENTS

RESULT AAY23738

ب

AAY23738 standard; Protein;

598

₿

AAY23738;

A surface protein of Neisseria meningitidis

Surface protein; surface glycoprotein; infection; vaccine;

08-SEP-1999 (first entry)

meningitidis infections Neisseria meningitidis surface proteins useful for treating WPI; 1999-418754/35. N-PSDB; AAX85790. Jennings MP, (ISIS-) ISIS INNOVATION LTD (UYQU ) UNIV QUEENSLAND. 12-DEC-1997; 14-DEC-1998; 24-JUN-1999. W09931132-A1. Neisseria meningitidis. immunoreactive peptide. Moxon ER, 97GB-0026398 98WO-AU01031 Peak IRA; z

```
RESULT
AAU06178
ID AAUC
XX
AC AAUC
XX
AC AAUC
XX
DT 24-C
XX
DE N. II
                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8 x 55 55 55 55 55 8 x 8
                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the detection or diagnosis of N. meningitidis infection can also be used to The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especial in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans make we consider the detection of diagnosis of N. meningitidis infection in humans who we consider the detection of diagnosis of N. meningitidis infection in humans who we consider the detection of diagnosis of N. meningitidis infection in humans who we consider the detection of diagnosis of N. meningitidis infection in humans who we can be a supported by the detection of diagnosis of N. meningitidis infection in humans who we can be a supported by the detection of the detection of the detection of the detection of diagnosis of N. meningitidis infection in humans when the detection of the detec
                                                     24-OCT-2001
                                                                                                     AAU06178;
                                                                                                                                                   AAU06178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 1;
                                                                                                                                                                                                                                                                                                                           601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     117
                                                                                                                                                                                                                                                                           595 gyqw 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
     meningitidis BZ10 surface
                                                                                                                                                                                                 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ylepvqrtavvlsfrsdkegtgeke-gtedsnwavyfdekrvlkagaitlkagdnlkikq
                                                                                                                                                                                                                                                                                                                           GYQW 604
                                                                                                                                                                                                                                                                                                                                                                         LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ntnentnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mnkisriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqa---natddddl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddega
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tfasgngttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtt--asdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgkl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tngdptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       lnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiat
                                                                                                                                                   standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          598 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    91-93; 132pp; English.
                                                                                                                                                   Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         89.48;
                                                                                                                                                   598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
Pred.
antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         No. 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 20;
.6e-183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   especially
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         48C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                                                                                            600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ω
```

Sequence

8

present invention.

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain BZ10 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Key
Region
                                                                                                                                                                                                                         New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for the preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                   Claim 9; Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                    WPI; 2001-488774/53
                                                                                                                                                                                                                                                                                                                                                         25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                25-JAN-2001;
                                                                                                                                                                                                                                                                                                                                                                                                      02-AUG-2001.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Surface
                                                                                                                                                                                                                                                                                                                                  (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                              WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitidis strain
                                                                                                                                                                                                                                                                                                                                                         2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "1
131..194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note= "Conserved region 51..104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= V4
/note= "Variable
243..598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Conserved 236..242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= V3
/note= "Variable
217..235
                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label- C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     note= "Variable"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ٧2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BZ10.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                       treating
                                                                                                                                                                                                                                       or
```

```
ν,
                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                            Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches 469;
                                                                                                                                       08-SEP-1999
                12-DEC-1997;
                                14-DEC-1998;
                                                               W09931132-A1
                                                                              Neisseria meningitidis
                                                                                                                      A surface protein of Neisseria
                                                                                                                                                                       AAY23742
(ISIS-) ISIS
                                                                                               immunoreactive
                                                                                                                                                                                                               595
                                                                                                                                                                                                                              601
                                                                                                                                                                                                                                              535
                                                                                                                                                                                                                                                             541
                                                                                                                                                                                                                                                                                                                                                                                                                                             177
                                                                                                                                                                                                                                                                              475
                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                              415
                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                             355
                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                             295
                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -
                                                                                                                                                                                       ω
                                                                                                                                                                                                              мБ.
| | | | |
                                                                                                                                                                                                                              GYQW
                                                                                                                                                                                                                                                                                                                                          AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                     LNYGSKXXNKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNXIDNYXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                    VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                          TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   XXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ylepvqrtavvlsfrsdkegtgeke-gtedsnwavyfdekrvlkagaitlkagdnlkikq
                                                                                                                                                                                                                                            aglaqaylpgksmmaigggtyrgeagyaigyssisdtgnwv1kgtasgnsrghfgtsasv
                                                                                                                                                                                                                                                                            lnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiat
                                                                                                                                                                                                                                                                                                           {\tt vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddega}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \verb|ntnentnentndssftyslkkd| \verb|td| tsvetek| | sfgangnkvnitsdtkg| lnfaketag|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mnkisriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqa···natddddl
                                                                                                     protein;
                                                                                                                                                                       standard;
                                                                                                                                                                                                               598
                                                                                                                                                                                                                              604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
 INNOVATION LTD
                                                                                                                                       (first entry)
                97GB-0026398
                                                                                              n; surface glycoprotein; peptide.
                                98WO-AU01031
                                                                                                                                                                       Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   89.48;
77.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2235;
Pred. No. 3
                                                                                                                      meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                      infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3.6e-183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                             600
                                                                                                                                                                                                                                                                                             540
                                                                                                                                                                                                                                                                                                            474
                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                            414
                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                           354
                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                            294
                                                                                                                                                                                                                                                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                                                                                                                                                                            236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ω
```

```
ρ
                                               В
                                                                                       Qy
                                                                                                                                        밁
                                                                                                                                                                              Qy
                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in human the detection or diagnosis of N. meningitidis infection in the detection of diagnosis of N. meningitidis infection in the detection of diagnosis of N. meningitidis infection in the diagnosis of N. meningiti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especial in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis surface proteins useful for treating meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (UYQU ) UNIV
    601
                                                 535
                                                                                            541
                                                                                                                                        475
                                                                                                                                                                                     481
                                                                                                                                                                                                                                  415
                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                         355
                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GYQW
                                                                                                                                                           LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                     VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXRASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                    {\tt lnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiat}
                                                                                                                                                                                                                             vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddega
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tngdptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ntnentnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ylepvqrtavvlsfrsdkegtgeke-gtedsnwavyfdekrvlkagaitlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Page 108-110; 132pp;
       604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     89.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2234;
No. 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 20;
1.4e-183;
nes 129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          optionally
n a kit for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
```

ω ••

176

595

**W**PYB

474

600 534 540 414 420

354 360 294

Ψ

```
RESULT
AAU06177
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modifiled or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of
medicaments.
                                                                                Claim 9;
                                                                                                New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for to preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAU06177
                                                                                                                                                                                                  25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAU06177
                                                                                                                                                                                (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                    25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                      02-AUG-2001.
                                                                                                                                                                                                                                                       WO200155182-A1
                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Surface antigen NhhA; meningococcal
                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4
                                                                                                                                                                IRA,
                                                                                                                                              2001-488774/53.
                                                                                                                                      AAS09167
                                                                               Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                standard; Protein; 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       meningitidis strain H15
                                                                                                                                                                Jennings
                                                                                ۳.
The
                                                                                                                                                                                                   2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first
                                                                              91pp;
                                                                                                                                                                                                                                                                                         /note= "Variable 243..598
                                                                                                                                                                                                                                                                                                                                                /note=
217..2
                                                                                                                                                                                                                                                                                                                                                                                                                                /note=
117..1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Conserved 51..104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H15 surface
                                                                                                                                                                                                                                                                                                                    /label= C4
/note= "Conserved
236..242
                                                                                                                                                                                                                                                                                                                                                                                                    /note=
131..19
mutant
                                                                                                                                                                                                                                                                                 /label=
                                                                                                                                                                                                                                                                                                                                                                          195.
                                                                                                                                                                                                                                                                                                                                                                                                                      /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                          105..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                 label=
                                                                                                                                                                                                                                                                                                                                                                                  note= "Conserved"
                                                                                                                                                                                                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= V1
                                                                                                                                                                MP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entry)
                                                                                                                                                                                                                                                                                                                                                                          . 216
                                                                                                                                                                                                                                                                                                                                                                                                                                . 130
                                                                                                                                                                                                                                                                                                                                                235
                                                                                English.
                                                                                                                                                                                                                                                                                                                                                      "Variable
                                                                                                                                                                                                                                                                                                                                                                                                            "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                     "Conserved
                                                                                                                                                                                                                                                                        "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                ဌ
proteins when used
                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                            C
                                                                                                                                                                                                                                                                                                                                                                                                                       ۷2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ဌ
                                                                                                                                                                                                                                                                                   G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A
                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                       region
                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                             region
                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                              2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  <u>⊢</u>
                                                                                                                                                                                                                                                                          ω
                                                                                                                                                                                                                                                                                                                                                                                  ω
as
a vaccine can effectively
                                                                                                          treating
                                                                                                                   from
                                                                                                          Or.
```

```
RESULT
AAY23745
δÃ
                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen what from N. meningitidis strain H15 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in the present interval.
                      Surface protein; immunoreactive po
                                                             A surface
                                                                                     08-SEP-1999
                                                                                                            AAY23745
                                                                                                                                     AAY23745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the present invention.
                                                                                                                                                                                               595
                                                                                                                                                                                                                        601
                                                                                                                                                                                                                                               535
                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                               475
                                                                                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                              415
                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                             355
                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                             295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           سر
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Н
                                                                                                                                                           ഗ
                                                                                                                                                                                                                                                                                           GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gyqw
                                                                                                                                                                                                                        GYOW
                                                                                                                                                                                                                                             {\tt aglaqaylpgksmmaigggtyrgeagyaigyssisdtgnwvikgtasgnsrghfgasasv}
                                                                                                                                                                                                                                                          AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                     VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                        TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                       VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtt--asdnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgkl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \verb|ntnentnentndssftyslkkd| \verb|td| tsvetek| \\ sfgangnkvnitsdtkg| \\ lnfaketag|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      XXXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ylepvqrtavvlsfrsdkegtgeke-gtedsnwavyfdekrvlkagaitlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddega
                                                                                                                                                                                                                                                                                                                                                                                            tfasgngttatvskddggnitvkydvnvgdalnvnglqnsgwnldskavagssgkvisgn
                                                                                                                                                                                                                                                                                                                                                                                                                                            vtgkgkdengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtkv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tngdptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnik gvkp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity 77.6
59; Conservative
                                                                                                                                     standard; Protein;
                                                                                                                                                                                               598
                                                                                                                                                                                                                      604
                                                           protein of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     598
                                                                                   (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AA;
                                   surface
                                                                                  entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    89.4%;
                                   glycoprotein; infection;
                                                                                                                                     589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2234; DB 22;
Pred. No. 4.4e-183;
0; Mismatches 129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6;
                                                                                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                 594
                                                                                                                                                                                                                                                                        600
                                                                                                                                                                                                                                                                                               534
                                                                                                                                                                                                                                                                                                                      540
                                                                                                                                                                                                                                                                                                                                             474
                                                                                                                                                                                                                                                                                                                                                                                                                                            354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ħ.
```

Neisseria meningitidis

peptide

```
Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis : meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (ISIS-) ISIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WO9931132-A1
                  481
                                            406
                                                                       421
                                                                                                 346
                                                                                                                            361
                                                                                                                                                      286
                                                                                                                                                                                 301
                                                                                                                                                                                                              226
                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                   168
                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                        118
                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                               59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                              \mathbf{L}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1999-418754/35
DB; AAX85797.
LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                      VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                             XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                  vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddega
                                                                                                                                                                      VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                          elesvarsalvlqfmidkegngeie-stgdigwsiyyddhntlhgatvtlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                       mnkiyriiwnsalnawvvvseltrnhtkrasatvatavlatllsatvqa--natdtdede
                                                                                                                                                                                                                                                                tngdptvhlngigstltdtlagssashvdagnqst--hytraasikdvlnagwnikgvkt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1; Page 122-124; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INNOVATION QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Moxon
                                                                                                                                                                                                                                                                                                                     -sgkdftyslkkelkdltsveteklsfgangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98WO:AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2231.5;
Pred. No. 7.1e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5; DB 20
1.1e-183;
nes 120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                         420
                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                                 58
                                           465
                                                                    480
                                                                                                405
                                                                                                                                                                                                                                                                                                                                                                            117
                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                 540
                                                                                                                                                     345
                                                                                                                                                                               360
                                                                                                                                                                                                                                                                                                                     167
                                                                                                                                                                                                           285
                                                                                                                                                                                                                                                                225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4;
```

d Qy

Qy Qy Db

40 AG 60

0 y 0 y 0 y 0 y

Вb

```
RESULT
AAU06173
ID AAUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                          N. meningitidis P20
      New NhhA surface antigen polypeptides and polynucleotides from Nelsseria meningitidis, useful in producing vaccines for treat preventing broad spectrum of Nelsseria meningitidis -
                                                                         (UYQU
                                                                                                                       02-AUG-2001.
                                                                                                                                                                                                                                                                                                                                                           Key
                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                                                                                          Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                         24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                       AAU06173
                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAU06173 standard;
                                                                                         25-JAN-2000;
                                                                                                       25-JAN-2001;
                                                                                                                                     WO200155182-A1.
                                                                                                                                                                   Region
                                                                                                                                                                                         Region
                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GYOW
                                                          IRA,
                                     2001-488774/53.
DB; AASO9163.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        lnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvngnaragiaqaiat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                         ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           604
                                                                                                                                                                                                                                                                                                                                                                           meningitidis strain
                                                          Jennings
                                                                                        2000US-0177917
                                                                                                        2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                        (first
                                                                                                                                                                                        /label= C4
/note= "Conserved
225..233
                                                                                                                                                                  234..589
                                                                                                                                                                                                                                                             /note= "Variable
122..185
                                                                                                                                                                          /label= V4
/note= "Variable region
                                                                                                                                                                                                                       /note= "Variable
                                                                                                                                                                                                                              /label=
                                                                                                                                                                                                                                      186..205
                                                                                                                                                                                                                                              /label= C3
/note= "Conserved
                                                                                                                                                                                                                                                                           /label= v2
                                                                                                                                                                                                                                                                                                  /label=
                                                                                                                                                                                                                                                                                                          106..117
                                                                                                                                                                                                                                                                                                               /note=
                                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
                                                                                                                                                    note= "Conserved"
                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                           note= "Conserved
                                                                                                                                                                                                                                                                                                                        /label= V1
                                                                                                                                                                                                                                                                                                                                      'note=
                                                                                                                                                                                                                                                                                                                                              /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein;
                                                                                                                                                                                                                                                                                                                                                                                                         surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                        entry)
                                                                                                                                                                                                                                                                                                                "Variable region
                                                                                                                                                                                                                                                                                                                                      "Conserved region
                                                                                                                                                                                                                                                                                                                                               ច
                                                                                                                                                                                                                                                                                                    CN
                                                                                                                                                                                                                                                     C3
                                                                                                                                                                                                                                                                                                                                                                            P20.
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ą
                                                                                                                                                                                                                       region
                                                                                                                                                                                                                                                                   region
                                                                                                                                                    region
                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                region
                                                                                                                                                                                                                                                                     Ŋ
                                                                                                                                                                                                                                                                                                                 ۳,
              treating
              or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        525
```

Claim

9;

Fig

1; 91pp;

English

```
RESULT
AAY57045
ΧIJ
        AAY57045 standard; Protein; 591
                          7
```

(AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively inmunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain P20 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in Sequence present invention present invention. esent invention relates to the isolation of novel Neisseria itidis mutant polypeptides of the surface antigen Nhha 182-AAU06186). The modified or mutant Nhha polypeptides are 589 AA;

BASB029; Nisseria meningitidis; surface fibril protein; infection; treatment; prevent; antibacterial drug.

HSF; diagnosis;

H44/76.

BASB029 amino acid

sequence from N. meningitidis strain

21-FEB-2000 (first entry)

Query Match Best Local :

Local Similarity

89.3%; 77.6%;

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                       γ
                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QY
                                                                                  δõ
                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                               밁
 В
                         δõ
                                                     밁
                                                                                                              ₽
                                                                                                                                         QY
                                                                                                                                                                      밁
                                                                                                                                                                                                 Q
                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches 469;
 586
                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                226
                                                                                                                                                                                                                                                                                                                                                                                                       168
                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                118
                            601
                                                                                                                466
                                                                                                                                           481
                                                                                                                                                                       406
                                                                                                                                                                                                                                346
                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                       286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121 XXXXXXXXXXXXXTTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXX 60
                                                                                                                                                                                     VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA 480
                                                                                                                                                                                                                             GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                     TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      elesvarsalvlqfmidkegngeie-stgdigwsiyyddhntlhgatvtlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   mnkiyriiwnsalnawvvvseltrnhtkrasatvatavlatllsatvqa--natdtdede
                            GYQW 604
                                                                    AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                      vtgkgkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtkv
                                                                                                                                                                                                                                                                                                                    VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                            {\tt gsttgqsenvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgkl}
                                                                                                                                                                                                                                                                                                                                                                                                       tngdptvhlngigstltdtlagssashvdagnqst--hytraasikdvlnagwnikgvkt
                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----sgkdftyslkkelkdltsveteklsfgangnkvnitsdtkglnfaketag 167
gyqw 589
                                                                                                                                              LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                       vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddega
                                                     aglaqaylpgksmmaigggtylgeagyaigyssisdtgnwvikgtasgnsrghfgtsasv
                                                                                                              lnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvngnaragiaqaiat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 2231.5; DB 22; Length 589;
Pred. No. 7.1e-183;
0; Mismatches 120; Indels 15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         117
                                                                                                                                              540
                                                                                                                                                                          465
                                                                                                                                                                                                                                 405
                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                   285
                                                                                                                                                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                                                                                                                                                          225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58
                                                                                                                 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4;
```

```
/note=
Misc-difference 123
                                                                  Misc-difference
                                                                                      Misc-difference
                                                                                                                             Misc-difference
                                                                                                                                              Misc-difference 98
                                                                                                                                                                   Misc-difference
                                                                                                                                                                                       Misc-difference
                                                                                                                                                                                                                   Neisseria meningitidis.
 07-MAY-1999;
                   18-NOV-1999.
                                      WO9958683-A2
99WO-EP03255
                                                                  /note=
389
                                                                                      /note=
269
                                                                                                                             /note=
108
                                                                                                                                                                     92
                                                                                                                                                                                        90
                                                                                                                                                                                                Location/Qualifiers
                                                         /note=
                                                                                                                                                          note=
                                                                                                                                                                            'note-
                                                          "Encoded
                                                                                                                                     "Encoded by
                                                                                                                                                          "Encoded by GAT"
                                                                                                                                                                             "Encoded by AAT"
                                                                            "Encoded by
                                                                                                "Encoded
                                                                                                                    "Encoded
                                                         γď
                                                                                               γd
                                                                                                                   by AATC'
                                                                                                                                      AAC "
                                                          CGT"
                                                                              AAA"
                                                                                                 ACA"
```

(SMIK ) SMITHKLINE BEECHAM BIOLOGICALS

Ruelle

N-PSDB; WPI; 2000-053103/04. AAZ39865

New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal

Claim 4; Fig 2; 74pp; English.

This is the Nisseria meningitidis BASB029 amino acid sequence from CC serogroup B strain H44/76. The BASB029 protein is homologous to the CC serogroup B strain H44/76. The BASB029 protein. The invention CC Haemophilus influenzae surface fibril (HSP) protein. The invention CC polypeptides to BASB029 polynucleotide sequences (AAX39864-Z3985) and CC polypeptide sequences (AAX57044-Y57045) and their immunogenic fragments. CC BASB029 polypeptides are useful in a method of diagnosing a Neisseria CC meningitidis infection in a mammal. Compositions containing BASB029 CC polynucleotides and polypeptides are useful for generating an immune CC response in an animal. A therapeutic composition comprising an antibody CC directed against BASB029 is useful in treating humans with Neisseria CC meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an CC infection which results from increased or decreased expression of the CC polynucleotide, and for therapeutic or prophylactic purposes, CC polynucleotide, and for therapeutic or prophylactic purposes. polynucleotides and polypeptides are also useful for treating infections particularly bacterial infections. The protein is useful in the screening and development of antibacterial drugs. Fused recombinant protein is useful for the stimulation of the immune system of an organism the protein. system of an organism

Sequence 591

Query Match Best Local Similarity 89.3%; 77.6%; Score 2231.5; DB 2 Pred. No. 7.2e-183; 21; Length 591;

```
RESULT
AAY23743
ID AAY2
XX AAY2
XX AAY2
XX O8-9
XX Suri
XX Suri
XX Suri
XX Inmn
XX Heli
XX Well
XX Wel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                  (UYQU)
                                                                                                                                                                                                                                                                                                                                       A surface
                                                                             12-DEC-1997;
                                                                                                                  14-DEC-1998;
                                                                                                                                                                                                W09931132-A1
                                                                                                                                                                                                                                       Neisseria meningitidis
                                                                                                                                                                                                                                                                            Surface protein; immunoreactive p
                                                                                                                                                                                                                                                                                                Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAY23743 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        мБАБ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GXTXXXXVVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    XXXXXXXXXXXXXTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               {\tt tngdttvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkp}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          {\tt tfasgkgttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgn}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         469;
                      VIND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               604
                                                                                                                                                                                                                                                                                                                                     protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                  INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                            (first entry)
                                                                                                                                                                                                                                                                          n; surface
peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -ngsnftyslkkdltdltsvgteklsfsangnkvnitsdtkglnfaketag
                                                                             97GB-0026398
                                                                                                                    98WO-AU01031
                                                                                                                                                                                                                                                                                                                                     of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                              glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                          æ
                                                                                                                                                                                                                                                                                              infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ω
```

```
Qy
                                         В
                                                         Ωy
                                                                                В
                                                                                                 QY
                                                                                                                       밁
                                                                                                                                       δÃ
                                                                                                                                                              В
                                                                                                                                                                                QY
                                                                                                                                                                                                     B
                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                              ₽
                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N, meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, respecially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Jennings
                                                                                                                                                                                                                                                                                       178
 596
                     601
                                         536
                                                            541
                                                                                 476
                                                                                                                       416
                                                                                                                                          421
                                                                                                                                                                356
                                                                                                                                                                                                       296
                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                               238
                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                             118
                                                                                                   481
                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                       59
                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                             мБАБ
| | | |
                                                                                                                                                             GYQW 604
                                       LNYGSKXXNKPYRITNVAPGYKEGDYTNVAQLKGYAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                 VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                      vtgkgkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnv
                                                                                                                                                                                                               VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                      tngdttvhlngigstltdtllntgattnvtndnvtddkkkraasvkdvlnagwnikgvkp
                                                                                                                                                                                                                                                                                                 elepvvrsalvlqfmidkegngene-stgnigwsiyydnhntlhgatvtlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                          1999-418754/35
                                                                              {\tt lnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqalate}
                                                                                                                       vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddkga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ΜP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        . 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             114-115; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                               89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2231.5; DB 2
Pred. No. 7.3e-183;
D; Mismatches 130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                      5
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
```

ω

120 58

RESULT

480

600

540

420

355

415

360

300

295

240 177

w

```
AAU06176
ID AAU
   would be
       The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than
                                                                                                      New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for t preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAU06176 standard;
                                                                                         Claim
                                                                                                                                                                                                25-JAN-2000;
                                                                                                                                                                                                                25-JAN-2001;
                                                                                                                                                                                                                                                WO200155182-A1
                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAU06176;
                                                                                                                                                                                OVQU)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   meningitidis
                                                                                                                                         2001-488774/53.
DB; AAS09166.
                                                                                        9;
                                                                                                                                                                               ) UNIV
                                                                                       Fig 1; 91pp; English
 expected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis strain H38.
                                                                                                                                                               Jennings MP
                                                                                                                                                                               QUEENSLAND
                                                                                                                                                                                                                2001WO-AU00069
                                                                                                                                                                                                2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NhhA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   H38 surface antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                     51..105
                                                                                                                                                                                                                                                                       /label=
                                                                                                                                                                                                                                                                                     /label= V4
/note= "Variable
                                                                                                                                                                                                                                                                                                       237..243
                                                                                                                                                                                                                                                                                                             /label= C4
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                    /label= V3
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                    /note= "Conserved
196..217
                                                                                                                                                                                                                                                                                                                                                                                    /label= V2
/note- "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                   /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                            note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                     'label=
                                                                                                                                                                                                                                                                                                                                                                                                            'note=
                                                                                                                                                                                                                                                                                                                                                                                                                      Labe1=
                                                                                                                                                                                                                                                                                                                                                                                                                                            'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'label=
  trom
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entry)
                                                                                                                                                                                                                                                                               . 599
                                                                                                                                                                                                                                                                                                                              . 236
                                                                                                                                                                                                                                                                                                                                                                             . 195
                                                                                                                                                                                                                                                                                                                                                                                                                             117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   meningococcal
                                                                                                                                                                                                                                                                                                                                                                                                                                    "Variable
                                                                                                                                                                                                                                                                                                                                                                                                            "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Conserved
                                                                                                                                                                                                                                                               "Conserved region
                                                                                                                                                                                                                                                                                                                                                                      င္ပ
                                                                                                                                                                                                                                                                                                                                                                                                                                             <u>√</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ជ
 corresponding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A
                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                             region
                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NhhA polypeptide sequence
N. meningitidis wild-type surfac
                                                                                                                                                                                                                                                                                                                                     ω
                                                                                                                                                                                                                                                                                                                                                                                     2
                                                                                                               treating
                                                                                                                        from
                                                                                                                 or
                                                                                                                                                              δÃ
                                                                                                                                                                                              20
                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                             ₽
                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0000x3
   рЬ
                                                                                                                                                                               В
                                                                                                                                                                                                               B
                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                             Вp
                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                  Neisseria meningitidis
```

```
RESULT
AAY27202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain H3B is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given ithe present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
bacterial
                                                                                    Amino acid
                                                                                                                                                24-SEP-1999
                                                                                                                                                                                                            AAY27202;
                                                                                                                                                                                                                                                                       AAY27202 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                        596 gyqw 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                   10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNXIXRIIWNSALNAWVXVSELTRNHTKRASATVXTAVLATLLXATVQAXXXXXXXXXXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         elepvvrsalvlqfmidkegngene-stgnigwsiyydnhntlhgatvtlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ntnkntnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     vspskgkmdetvnin agnnie itrngknid i atsmtpqfssvslgagadaptlsvddkgaller agnnie i atsmtpqfssvslgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagadaptlsvdgagada
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gtt--asdnvdfvhtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgkl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   mnkiyriiwnsalnawvavseltrnhtkrasatvktavlatllfatvqa--natdedeee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    lnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tngdttvhlngigstltdtllntgattnvtndnvtddkkkraasvkdvlnagwnikgvkp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         XXXXXXXXXXXXXFTYSLKKXLXXXXXYTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    604
                            meningitidis
infection; treatment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          599
                                                                                    sequence of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                (first
                                                                                                                                                entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   89.3%;
77.6%;
                            protein;
                                                                                    N. meningitidis protein
                                                                                                                                                                                                                                                                           591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2231.5; DB 2 Pred. No. 7.3e-183;
                            pharmaceutical;
                                                                                                                                                                                                                                                                       A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22;
                                                                                       ORF40-1.
                               vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                               diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sequences
ns given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ħ
```

```
Query Match
Best Local S
Matches 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    09-OCT-1998;
14-JAN-1998;
01-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   meningitidis (strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g. a vaccine composition or a diagnostic composition. The composition is also useful for treating or preventing an infection due to Neisserial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        diagnostic compositions for treating meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The invention provides proteins (AAY27201-245) from Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               New protein and its nucleotide sequence,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (CHIR-) CHIRON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14-JAN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          bacteria,
                                                                                                                                                                                                                    241
             468
                                  481
                                                         409
                                                                               421
                                                                                                     349
                                                                                                                          361
                                                                                                                                                 289
                                                                                                                                                                      301
                                                                                                                                                                                              231
                                                                                                                                                                                                                                          171
                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                 _
                                                                                                                                                                                                                                                                                                                                                                                                       1
                     LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                              TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                         VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                       GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                           1999-444400/37.
DB; AAX99124.
                                                                  VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                  \tt tfasgkgttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgn
                                                                                                                                               vtgkdkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnv
                                                                                                                                                                                             gtt--asdnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgkl
                                                                                                                                                                                                                                        tngdttvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkp
                                                                                                                                                                                                                                                                                                           XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                y \texttt{ldpvqrtvavlivnsd} keg \texttt{tgekekveensdwavyfnekgvltareitlkagdnlkikq}
                                                                                                                                                                                                                                                                                                                                                        mnkiyriiwnsalnawvvvseltrnhtkrasatvktavlatllfatvqasanneeqeedl
          lnvgskkdnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiat
                                                                                                                                                                                                                                                               TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1; Page 62; 123pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ģ
                                                                                                                                                                                                                                                                                                                                                                                         especially Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Masignani
                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                    -ngtnftyslkkdltdltsvgtekisfsangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SPA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   98GB-0022143.
98GB-0000760.
98GB-0019015.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99WO-IB00103
                                                      inagnnieitrngknidiatsmtpqfssvslgagadaptlsvd-gda
                                                                                                                                                                                                                                                                                                                                                                                                                                       89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ۷,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pizza
                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2230.5;
Pred. No. 8.7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rappuoli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and/or preventing Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                      5; DB 21
3.7e-183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                useful in vaccines
                                                                                                                                                                                                                                                                                                                                                                                                                            122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Scarlato
                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ۲,
                                                                                                                                                                                                                                                                                                                                                                                                                            13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or
                                                                                                                                                                                                                                                                                                                                                                                                    60
                                 540
                                                                             480
                                                                                                                         420
                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                     170
                                                                                                  408
                                                                                                                                                348
                                                                                                                                                                     360
                                                                                                                                                                                                                                                                                                                                                                                60
                                                      467
                                                                                                                                                                                            288
                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                            ω
--
                                                                                                                                                                                          οy
                                            밁
                                                               Qy
                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
밁
                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                   Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                 Claim
121
                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           528
                                            61
                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11
                                                                                          _
                                                                                                              نسا
```

Db

δ

밁 δõ B ρy

밁 δÃ 밁 Qγ Дb B Ş 밁 Ş B δÃ

δÃ

```
The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans.
                                                                                                                                                                                                                                                       The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A surface
                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY23741;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAY23741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (ISIS-) ISIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Surface protein;
immunoreactive p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           541
                                                                                                                                                                 Local
                                                                                                                                                                               Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9ygw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GYQW
                                                                                                      1999-418754/35
XXXXXXXXXXXXXFTYSLKKXLXXXXXXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                             yldpvlrtvavlivnsdkegtgekekveensdwavyfnekgvltareitlkagdnlkikg
                                                           mneilriiwnsalnawvvvseltrnhtkrasatvktavlatllfatvqasanneeqeedl
                                                                                                                                                   469;
                                                                                                                                                                                                                                                                                                                                                                                                          ۳.
                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            standard;
                                                                                                                                                                                                                                                                                                                                                                                                       Page 104-106; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitidis surface
                                                                                                                                                                                                                            591
                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INNOVATION
QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first
                                                                                                                                                                                                                                                                                                                                                                                                                                      infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Moxon
                                                                                                                                                                                                                           AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     glycoprotein;
                                                                                                                                                O; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IRA;
                                                                                                                                                                                                                                                                                                                                                                                                         English
                                                                                                                                                                                                                                                                                                                                                                                                                                                   proteins
                                                                                                                                                            2230.5; DB 2
No. 8.7e-183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      useful
                                                                                                                                                                               20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      for
                                                                                                                                                                                                                                                                                                                                                                                                                                                    treating
                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                      z
                                                                                                                                                  Gaps
 180
                                                           120
                                                                                                                      60
                               120
                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                587
                                                                                                                                                   ω
••
```

Ψ

```
RRSULT 1
AAY23746
ID AAY2
XX AAY2
XX AAY2
XX AAY2
XX Surf
KW Immu
XX Surf
KW Immu
XX Surf
KW Immu
XX I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally
                                                                                                                                                                                                             WPI; 1999-418754/35
N-PSDB; AAX85798.
                                                                                                                                                                                                                                                                                                                               (ISIS-)
                                                                                                                                                                                                                                                                                                                                                                                                       12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY23746 standard;
                                                                                                                                         Neisseria meningitidis surface proteins useful meningitidis infections
                                                                                                                                                                                                                                                                                 Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                14-DEC-1998;
                                                                                           Claim 1; Page 127-128; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Surface protein; surface immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  588 gyqw 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      vtgkdkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gtt--asdnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgkl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GXTXXXXVVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     lnvgskkdnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvd-gda
                                                                                                                                                                                                                                                                                                                                   VINU
                                                                                                                                                                                                                                                                                                                                 INNOVATION QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                   Moxon
                                                                                                                                                                                                                                                                                                                                                                                                       97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                   98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Protein;
                                                                                                                                                                                                                                                                                     ER,
                                                                                                                                                                                                                                                                                                                                                         LTD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   591
                                                                                                                                                                                                                                                                                     IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              infection;
                                                                                                                                                                    for
                                                                                                                                                                 treating
    optionally
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      348
```

```
RESULT
AAU06171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                    Surface antigen NhhA; meningococcal disease; meningitis
                                                                                                                 N. meningitidis
                                                                                                                                                                                                                                                                   AAU06171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            171
                                                                                                                                                                                                                                                                                                                                                                                          588
                                                                                                                                                                                                                                                                                                                                                                                                                                       601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----
GYQW
                                                                                                                                                                                                                                                                                                                                                                                     ΨÞKḃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TNGDXTVHLNGIGSTLTDXLXXXXAXXXXXXXXXXXXXXXXXAASXKDVLNAGWNIKGVKX 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \verb"aglvqaylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgas as value of the property of the 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gtt--asdnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgkl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----ngtnftyslkkdltdltsvgteklsfsangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       y \texttt{ldpvqrtvavlivnsdkegtgekekveensdwavyfnekgvltareitlkagdnlkikq}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvd-gda
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tngdttvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnik gvkp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       XXXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  al Similarity
469; Conser
                                                                                                                                                                                                                                                                   standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                          591
                                                                                                                                                                                                                                                                                                                                                                                                                                       604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                      PMC21 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 2230.5; DB 20;
pred. No. 8.7e-183;
0; Mismatches 122; I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   in a kit for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
```

Neisseria

meningitidis strain

PMC21

Ψ

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain PMC21 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                       Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Key
Peptide
                                                                                                                                                                                                           New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                           N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                             Peak
                                                                                                                                                                                                                                                                                                                  UQYU)
                                                                                                                                                                                                                                                                                                                                        25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                               25-JAN-2001;
                                                                                                                                                                                                                                                                                                                                                                                     02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                            WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                    present
                                                                                                                                                                                                                                                                     2001-488774/53.
                                                                                                                                                                                                                                                           AAS09161
                                                                                                                                                                                                                                                                                                                  UNIV QUEENSLAND
                                                                                                                                                                                      Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                            Jennings
                     invention
                                                                                                                                                                                                                                                                                                                                                               2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= C1
/note= "Conserved region 51..108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              52..591
/label=_Mature_NhhA
                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note=
237..59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label= V3
/note= "Variable
211..229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note=
121..12
                                                                                                                                                                                                                                                                                                                                                                                                                              /label= C5
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= C3
/note= "Conserved
189..210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= V4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= C4
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note= "Variable
125..188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= v2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label= C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                109..120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= Signal_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                       . 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       . 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .124
                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          claimed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ۳,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    specifically
                                                                                                                                                                                                                        treating
                                                                                                                                                                                                                        or
```

Sequence

591

C2

```
RESULT :
밁
                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 469
                                                             Key
Region
                                                                                                                             z
        Region
                                   Region
                                                                                         Neisseria
                                                                                                           Surface
                                                                                                                                              24-OCT-2001
                                                                                                                                                                AAU06175;
                                                                                                                                                                                 AAU06175 standard;
                                                                                                                                                                                                                               588
                                                                                                                                                                                                                                                 601
                                                                                                                                                                                                                                                                    528
                                                                                                                                                                                                                                                                                                       468
                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                            409
                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                349
                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                   289
                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                                        231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                    14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                           meningitidis EG329 surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gyqw 591
                                                                                                                                                                                                                                                 GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                 aglvqaylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasv
                                                                                                                                                                                                                                                                            AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                               LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                          vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvd-gda
                                                                                                                                                                                                                                                                                                                                                     VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                               tfasgkgttatvskddggnitvmydvnvgdalnvnglqnsgwnldskavagssgkvisgn
                                                                                                                                                                                                                                                                                                                                                                                      TFASGXGTTATVSKDDQGNITVXXDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtt--asdnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgkl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                GXTXXXXXVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        XXXXXXXXXXXXXXTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    y \texttt{ldpvqrtvavlivnsdkegtgekekveensdwavyfnekgvltareitlkagdnlkikq}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       lnvgskkdnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----ngtnftyslkkdltdltsvgteklsfsangnkvnitsdtkglnfaketag
                                                                                                          antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                         meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                             (first entry)
                                   /note= '51..108
                                                                                                          NhhA; meningococcal disease;
        /note= "Variable region 109..120
                                                      /label= C1
                                                                      ocation/Qualifiers
                          /label= V1
                                                                                                                                                                                  Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    89.3%;
                                            "Conserved
                                                                                         strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2230.5; DB 2
Pred. No. 8.7e-183;
0; Mismatches 122;
                                                                                         EG329
                                                                                                                           antigen NhhA polypeptide sequence
                                                                                                                                                                                  ₿
                                            region
                                                                                                           meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                      600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                         540
                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                        527
                                                                                                                                                                                                                                                                                                                                            467
                                                                                                                                                                                                                                                                                                                                                                                408
                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                   348
                                                                                                                                                                                                                                                                                                                                                                                                                                                         288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
```

```
Š
                                     В
                                                           2
                                                                                       밁
                                                                                                             Š
                                                                                                                                                     Query Match
Best Local
                                                                                                                                         Matches
                                                                                                                                                                                                                                       The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antiqen Nhha (AAU06182-AAU06186). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain EG329 is 1 of 10 Nhha polypeptide sequences (AAU06181) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for the preventing broad spectrum of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                     Sequence
             121
                                     61
                                                              61
                                                                                        _
                                                                                                                                                     Local Similarity
                                                                                                                                                                                                                              present invention.
                                                                                    2001-488774/53
DB; AASO9165.
                                                               XXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                   y \verb|ldpv|| rtvavlivnsdkegtgekekveensdwavyfnekgv|| tareitlkagdn|| kikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                        Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Jennings
                                                                                                                                                                                                       591 AA;
                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label= V4
/note= "Variable : 237..591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "
121..124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note= "Conserved
230..236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= V3
/note= "Variable
211..229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Conserved
189..210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label= V2
/note= "Variable
125..188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             'label= C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    label=
¥.
                                                                                                                                                     89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CS
                                                                                                                                         0;
                                                                                                                                         Score 2230.5; DB 22; Length Pred. No. 8.7e-183; O; Mismatches 122; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                treating
                                                                                                                                          13;
                                                                                                                                                                   591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                or
                                                                                                                                          ω
```

```
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
  RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                AAY23740
                                                                                                                                                                                                                                                                                                                              08-SEP-1999
The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidi
                               Claim 1; Page 100-101; 132pp;
                                                    Neisseria meningitidis surface proteins useful meningitidis infections
                                                                                                                 Jennings MP,
                                                                                                                                     (ISIS-) ISIS
                                                                                                                                                                                                              24-JUN-1999.
                                                                                                                                                                                                                                  WO9931132-A1
                                                                                                                                                                                                                                                     Neisseria meningitidis
                                                                                                                                                                                                                                                                                   Surface protein; surface glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                  AAY23740
                                                                                                                                                                                                                                                                                                                                                                      AAY23740 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                    12-DEC-1997;
                                                                                                                                                                                         14-DEC-1998;
                                                                                                                                                                                                                                                                           immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    171
                                                                                                                                                                                                                                                                                                                                                                                                                         588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                             601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                          surface
                                                                                                                                                                                                                                                                                                                                                                                           15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TFASGXGTTATVSKDDQGNITVXYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gtt--asdnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgkl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GXTXXXXXVVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tngdttvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TNGDXTVHLNGIGSTLTDXLXXXXXXXXXXXXXXXXXXXXXXRAASXKDVLNAGWNIKGVKX
                                                                                                                                                                                                                                                                                                                                                                                                                                             GYQW 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   vtgkdkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnv
                                                                                    1999-418754/35
DB; AAX85792.
                                                                                                                                                                                                                                                                                                                                                                                                                       gyqw 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                               aglvqaylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 vspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvd-gda
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         {\tt tfasgkgttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgn}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----ngtnftyslkkdltdltsvgteklsfsangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                         protein of Neisseria meningitidis
                                                                                                                                       QUEENSLAND
                                                                                                                                                 INNOVATION
                                                                                                                                                                                                                                                                                                                             (first entry)
                                                                                                                    Moxon
                                                                                                                                                                     97GB-0026398
                                                                                                                                                                                          98WO-AU01031
                                                                                                                                                                                                                                                                          peptide
                                                                                                                    ER,
                                                                                                                                                  LTD
                                                                                                                     Peak
                                                                                                                                                                                                                                                                                                                                                                        594
                                 English.
                                                                                                                      IRA;
                                                                                                                                                                                                                                                                                                                                                                        B
                                                                  for treating
                                                                                                                                                                                                                                                                                       vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        230
```

meningitidis

```
Query Match 89.2%;
Best Local Similarity 77.6%;
Matches 469; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                          531
601
                                                   541
                                                                              471
                                                                                                        481
                                                                                                                                    411
                                                                                                                                                                421
                                                                                                                                                                                           351
                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                    233
                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                117
                                                                                                                                                                                                                                                                                                                                                                                                                          121 XXXXXXXXXXXXXXFTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Н
                                                                                                                                                                                                                                                                                                                                                     GYQW 604
                                   AGLXQAYLPGKSMMAIGGXTYXGEAGYAIGYSSISXXGNWXIKGTASGNSRGHFGXSASV
                                                                                           LNVGSKXXNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNXIDNVXGNARAGIAQAIAT
                                                                                                                                ----ntnentnassftyslkkdltdltsvgteklsfsansnkvnitsdtkglnfakktae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ylepvqrtavvlsfrsdkegtgeke-vtedsnwgvyfdkkgvltagtitlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             aglvqaylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasv
                                                                             lnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnhidnvdgnaragiaqaiat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2230; DB 20;
Pred. No. 9.7e-183;
0; Mismatches 125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                  600
                                                                                                                                   470
                                                                                                                                                              480
                                                                                                                                                                                                                                                                        360
                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                              172
                                                                             530
                                                                                                                                                                                                                                             350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4;
```

QY

70 AG AG

B 6

밁

Search completed: July 3, 2002, 08:09:13 Job time: 499 sec

į,

Qy Db

64 P

Вb

Qy Db

δÃ

04 PP

THIS PAGE BLANK (USPTO)

```
Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Post-processing: Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Total number of hits satisfying chosen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Word size :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB
DB
                                                                                                                                                                                                                                                                                                                                                                                                                                             Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           seq length:
seq length:
                                                                                                                                                                                                                                                                                                                                                                                                                                           Query
Match Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Issued_Patents_AA: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         231628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gapop 60.0 , Gapext 60.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OLIGO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-771-382-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             July 3,
        GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MNXIXRIIWNSALNAWVXVS.....TASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                   /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       seqs,
   2002, 08:24:09; Search time 14.71 Seconds (without alignments) 1002.927 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                              DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       24425594 residues
US-09-377-155-19
US-09-377-155-17
US-09-377-155-21
US-09-669-974-11
US-09-377-155-21
US-09-669-974-17
US-09-669-974-17
US-09-669-974-17
US-09-669-974-17
US-09-669-974-17
US-09-669-974-17
US-09-377-155-7
US-09-669-974-9
US-09-669-974-15
US-09-377-155-13
US-09-669-974-15
US-09-377-155-13
US-09-669-974-15
US-09-685-974-15
US-09-685-974-15
US-09-69-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           231628
                                                                                                                                                                                                                                                                                                                            Sequence 19,
Sequence 11,
Sequence 21,
Sequence 11,
Sequence 21,
Sequence 21,
                                                                                                                                                                                                                                                                                                                                                                                                                                           Description
 Sequence
Sequence
                                             Sequence
Sequence
Sequence
                                                                                                           Sequence
Sequence
                                                                                                                                        Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                 Sequence
Sequence
                                                                                                                                                                                                                                                                Sequence
Sequence
                                                                                                                                                                                                                                                                                               Sequence
                                Sequence
                                                                                              Sequence
                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                   Sequence
                             13, Appl
5, Appl
15, Appl
15, Appl
15, Appl
15, Appl
5, Appl
5, Appl
5, Appl
5, Appl
2, Appl
                                                                                                                                                                                      21, Appl
2, Appli
17, Appli
2, Appli
2, Appli
17, Appli
7, Appli
7, Appli
9, Appli
9, Appli
9, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    604
                                                                                                                                                                                                                                                                                                                                                                                                                            ; ORGANISM: Neisseria meningitidis US-09-377-155-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRIOR FILING DATE: 19:
NUMBER OF SEQ ID NOS:
SOFTWARE: PatentIn Ver
SEQ ID NO 19
LENGTH: 589
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-09-377-155-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 19, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION NUMBER: PCT/
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
```

PatentIn Ver.

33 2.0

Result

ö

45	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	31	30	29	28
9	9	9	10	10	12	12	12	13	13	13	13	13	13	13	17	19	19
1.5	1.5	1.5	1.7	1.7	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.8	3.1	3.1
1004	1002	36	679	679	607	607	607	2411	2354	2353	2353	2353	1912	1912	1094	1098	1098
4	4	4	4	4	4	ω	۳	4	4	4	4	4	ω	_	4	4	4
US-09-268-347-30	US-09-268-347-24	US-09-268-347-54	US-09-268-347-26	US-08-913-942-15	US-08-913-942-6	US-08-685-467-6	US-08-409-995-6	US-09-268-347-36	US-09-268-347-47	US-09-669-974-33	US-08-913-942-4	US-09-377-155-33	US-08-685-467-4	US-08-409-995-4	US-09-268-347-32	US-09-268-347-44	US-09-669-974-32
Sequence 30, Appl	Sequence 24, Appl	•	Sequence 26, Appl	Sequence 15, Appl	Sequence 6, Appli	Sequence 6, Appli	6, 1	Sequence 36, Appl	Sequence 47, Appl	Sequence 33, Appl	Sequence 4, Appli	Sequence 33, Appl	Sequence 4, Appli	Sequence 4, Appli	Sequence 32, Appl	Sequence 44, Appl	Sequence 32, Appl

## ALIGNMENTS

PEAK, Ian Richard Anselm JENNINGS, Michael Paul MOXON, E. Richard

NOVEL SURFACE ANTIGEN

PCT/AU98/01031 GB 9726398.2

```
RESULT 2
US-09-669-974-19
                                                                                                                             Sequence 19, Application US/09669974
Patent No. 6333173
GEMERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 9.8%;
Best Local Similarity 100.0%;
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                      CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                       369 YDVNYGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 427
                                                                                                                                                                                                                                                                                                                                                                                                                                                    384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 59; pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 4; Lu., 10. 9.1e-48; 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
```

0;

```
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 11

; ORGANISM: Neisseria meningitidis
US-09-669-974-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 19
LENGTH: 589
TYPE: PRT
                                                                                                                                                                                                                                                                                            Sequence 21, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 11, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 9.8%; Score 59; DB Best Local Similarity 100.0%; Pred. No. 9.1 Matches 59; Conservative 0; Mismatches
                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
SEQ-30 NO 21
                                                    CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                        APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION:
                  SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILE REFERENCE:
                                      NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 59; DB 4; Le
; Pred. No. 9.1e-48;
.: omatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 4; Le
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
```

```
; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; ORGANISM: Neisseria meningitidis US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                             US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 3
SOFTWARE: Patentin Ver. 2.0
                                                                  TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 59; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQ ID NO 11
LENGTH: 591
SEQ ID NO LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                      Sequence 21, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 11,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                           APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                   SOFTWARE: PatentIn Ver. 2.0
                                                    NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
 NO 21
TH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Application US/09669974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9.8%; Score 59; DB 4; L
100.0%; Pred. No. 9.1e-48;
vative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9.8%; Score 59;
100.0%; Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 4; L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 591,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
```

; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-669-974-21

0

```
; TYPE: PRT; ORGANISM: Neisseria meningitidis US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SSETWARE: PatentIn Ver. 2.0
SEO ID NO 2
LENGTH: 592
TYPE: PRT
ORGANISM: Neisseria meningitidis
US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 9.8%; Score 59; DB 4; Lobert Local Similarity 100.0%; Pred. No. 9.1e-48; Matches 59; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 9.8%; Score 59; DB 4; L
Best Local Similarity 100.0%; Pred. No. 9.1e-48;
Matches 59; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                               Sequence 17, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: JENNING, APPLICANT: JENNING, E. Richard APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN TITLE OF INVENTION: NOVEL SURFACE ANTIGEN OF 105/064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 2, Appli
Patent No. 619731
                                                                                   SOFTWARE:
SEQ ID NO 17
                                                                                                                                                                           FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                              APPLICANT: PEAK, Ian Richard Ansel APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                             PRIOR APPLICATION NUMBER: GB 9
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                          NUMBER OF SEQ ID NOS:
                                                                LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Application US/09377155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                       Ian Richard Anselm
                                                                                                                                                                                                                                                                                         NOVEL SURFACE ANTIGEN
                                                                                                                                                                     GB 9726398.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
```

0

```
; SOFTWARE: PatentIn Ver. 2.0

; SEQ ID NO 2

; LENGTH: 592

; TYPE: PRT

; ORGANISM: Neisseria meningitidis

US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: JENNINGS, MICHAEL PAUL
APPLICANT: MOXON, E. RICHAER
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
; ORGANISM: Neisseria meningitidis US-09-669-974-17
                                                                                                                   APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US/09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 10
US-09-669-974-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 9
US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
                                                         SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 17
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 17, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 2, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 9.8%; Score 59; Best Local Similarity 100.0%; Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: PEAK, Ian Richard Anselm
                                          TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9.8%; Score 59; ilarity 100.0%; Pred. No. Conservative 0; Mismatcl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 4; Le 9.1e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 4; Lo
9.1e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
```

```
. oy
                                                                                                                                        ; ORGANISM: Neisseria meningitidis US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-377-155-9

: Sequence 9, Application US/09377155

: Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; ORGANISM: Neisseria meningitidis US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 11
US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOFTWARE: Pa
SEQ ID NO 7
LENGTH: 594
                                                                                                                                                                                        NUMBER OF SEQ ID NOS:
SOFTWARE: PatentIn V
SEQ ID NO 9
LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 7, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Best Local Similarity 100 Matches 59; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                         FILE REFERENCE: 065064/ULZB
FILE REFERENCE: 05/09/377,155
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
CURRENT FILING DATE: PCT/AU98/01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: PEAK, Ian Richard Anse
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                             PRIOR APPLICATION NUMBER: PCT/AU98/010: PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: FILE REFERENCE: 06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRIOR FILING DATE: 1
NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: PRT
                                                                                                                                                                           TYPE: PRT
7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 372 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                  384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                                                    Local Similarity 100.0%;
hes 59; Conservative
PatentIn Ver. 2.0
                                                                                                                                                                                                                              PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         065064/0128
                                                                                                                                                                                                                                                                                                                                                                                       NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ω
ω
                                                                                       9.88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GB 9726398.2
                                                 Score 59; DB 4; Le
s; Pred. No. 9.2e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 59; DB 4; I
; Pred. No. 9.2e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pred. No. 9.1e-48;
Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                     Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 594
                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                    0;
```

```
밁
                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 14
US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; ORGANISM: Neisseria meningitidis US-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                 US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                         NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQ ID NO 7
LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 7, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 9, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match 9.8%; Score 59; DB 4; Length 594; Best Local Similarity 100.0%; Pred. No. 9.2e-48; Matches 59; Conservative 0; Mismatches 0; Indels
                                                                              Matches
                                                                                                 Best Local Similarity
                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION NUMBER: US/09/669,974
                                                                                                                                                                                                  ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: PRT
                                                                                                                                                                                                                          TYPE: PRT
                                                                                                                                                                                                                                         LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 374 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 432
384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                                                                            Conservative
                                                                                               9.8%;
                                                                              0;
                                                                                               Score 59;
Pred. No.
                                                                              Mismatches
                                                                              DB 4; Lt. . 9.2e-48; thes 0;
                                                                                                                  Length 594
                                                                                0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
  432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                0;
```

```
Sequence 5. Application US/09377155

Patent No. 6197312

GENERAL INFORMATION:
APPLICANT: PERK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. RICHARD
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128

CURRENT APPLICATION NUMBER: US/09/377,155

CURRENT FILING DATE: 1999-08-19

PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2

PRIOR FILING DATE: 1997-12-12

NUMBER OF SEQ ID NOS: 33

SOFTWARE: Patentin Ver. 2.0

SEQ ID NO 5

LENGTH: 598

TYPE: PAT
ORGANISM: Neisseria meningitidis
US-09-377-155-5
     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 15
US-09-377-155-5
                                                                                             Query Match 9.8%; Score 59; DB 4; Length 598; Best Local Similarity 100.0%; Pred. No. 9.2e-48; Matches 59; Conservative 0; Mismatches 0; Indels
0;
```

Search completed: July 3, 2002, 08:30:34 Job time: 385 sec

Gaps

THIS PAGE BLANK (USPTO)

```
Run
                                                                                                                           Result
                                                                                                                                                                                                                                                                                                                              Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                    Database
                                                                                                                                                                                                                                                                                                               Post-processing: Listing first 45
                                                                                                                                                                                                                                                                                                                                                  Total number of hits
                                                                                                                                                                                                                                                                                                                                                                Word size
                                                                                                                                                                                                                                                                                                                                                                                                Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                              Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                     Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein -
                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       on:
   112
113
113
113
114
115
                                                                                                                                                      and
                                                                                                                                                                   Pred. No.
                                                                                                                                                             score greater
                                                                                                                     Score
                                                                                                                                                      þ.
                                                                                                                                                                                                                                                                                                                             seq
  derived
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein search, using
                                                                                                                                                                                                                                                                                                                             length:
                                                                                                                                                                                                                                                                                     SPTREMBL_19:*
1: sp_archea:*
2: sp_bacteria
                                                                                                                   Query
Match
                                                                                                                                                           is the number of results predicted by chance to have ter than or equal to the score of the result being pu
                                                                                                                                                                                 7:
8:
9:
10:
11:
11:
12:
15:
15:
                                                                                                                                                                                                                                                                                                                                                                            562222 seqs,
                                                                                                                                                                                                                                                                                                                                                                                          Gapop 60.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                 OLIGO
                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-771-382-11
604
                                                                                                                                                                                                                                                                                                                                                                                                                                                      July
  GenCore version Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                              MNXIXRIIWNSALNAWVXVS...
   sp_unclassified:*
sp_rvirus:*
sp_bacteriap:*
sp_archeap:*
                                                                                                                                                                                                                                    sp_organelle:*
sp_phage:*
                                                                                                                                                                                                                                                    sp_mhc:*
                                                                                                                                                                                                                                                           sp_mammal:*
                                                                                                                                                                                                                                                                 sp_invertebrate:*
                                                                                                                                                                                                                                                                              sp_fungi:*
                                                                                                                                                                                                                                                                                     sp_bacteria:*
                                                                                                                                                                                                                                                                                          sp_archea:*
                                                                                                                                                     bу
                                                                                                                                                                                                                                                                                                                                                 satisfying chosen
                                                                                                                                                                                                           sp_vertebrate: *
                                                                                                                                                                                                                 sp_virus:*
                                                                                                                                                                                                                        sp_rodent:*
                                                                                                                                                                                                                               sp_plant:*
                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                              2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω
                                                                                                                                                      analysis of the total score distribution.
  2002, 08:30:29; Search time 34.27 Seconds (without alignments) 3048.991 Million cell updates/sec
                                                                                                                     DB
                                                                                                                                                                                                                                                                                                                                                                                          Gapext 60
  222212221122222
                                                                                                                                                                                                                                                                                                                                                                            172994929 residues
H
                                                                                                                                                                                                                                                                                                                 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SE
                                                                                                                                         SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   model
                                                                                                                                                                                                                                                                                                                                                 parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 4.5
Compugen
                                                                                                                                                                                                                                                                                                                                                                                                              .TASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ltd
                                                                                                                                                                                                                                                                                                                                                  562222
O9jps4 neisseria m
O9jps1 neisseria m
O9jps1 neisseria m
O9jqy1 neisseria m
O9jqs7 neisseria m
O9jps3 neisseria m
O9jqs7 neisseria m
O9jqs7 neisseria m
O9jqs6 neisseria m
O9jqs6 neisseria m
O9jqs7 neisseria m
O9jqs7 neisseria m
O9jqs8 neisseria m
O9jqs8 neisseria m
O9jps1 neisseria m
O9jps2 neisseria m
O9jps2 neisseria m
O9jps2 neisseria m
O9jps2 neisseria m
                                                                                                                   Description
                                                                                                                                                           printed,
                                                                                                                                                                                                                                                                                                                                                                                                              604
```

7	7	7	7	7	7	7	7	7	œ	œ	ထ	œ	æ	œ	œ	œ	13	19	59	59	59	59	59	59	59	59	59	59
•	1.2			•	٠					•		•	•		•	•	•	3.1				•	•			•		
180	179	173	159	157	120	94	93	88	3546	3313	3312	3301	1755	574	498	438	2353	1098	600	600	599	599	598	598	598	598	598	595
5	11	16	N	16	17	17	N	9	ນ	11	4	11	17	17	16	16	Ŋ	2	N	2	2	2	2	2	Ν	N	N	2
Q18085	8WT66D	Q9KCQ4	Q9Z621	Q9RUI0	028622	Q96x74	Q9ZIX9	021889	Q9F830	088278	Q9NYQ7	Q91ZI0	026812	026815	Q92U87	Q9L6G4	P71401	Q48152	Q9JPS5	Q9JPS6	Q9JPR8	Q9JPS8	Q93QY5	Q9JPS0	Q9JPR7	Q9JPR9	Q9JPT0	Q9JРН0
Q18085 caenorhabdi	Q991m8 mus musculu	Q9kcq4 bacillus ha	Q9z621 salmonella	Q9rui0 deinococcus	O28622 archaeoglob	Q96x74 sulfolobus			Q9f830 micromonosp	ratt	Q9nyq7 homo sapien	Q91zi0 mus musculu	O26812 methanother	O26815 methanother			P71401 haemophilus	Q48152 haemophilus	Q9jps5 neisseria m	Q9jps6 neisseria m	jpr8	Q9jps8 neisseria m	Q93qy5 neisseria m	Q9jps0 neisseria m	Q9jpr7 neisseria m	Q9jpr9 neisseria m		Q9jph0 neisseria m

## ALIGNMENTS

```
OSTPS4
ACCOCC
BRACK
COCC
BRACK

                                                                                                                                                   MEDITINE-20175756; PubMed=10710308;
MEDITINE-20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Commanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Caleotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Ratti G., Santini L., Knapp B., Blair E., Mason T., Tettelin H.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2000 (TrEMBLrel. 16, Last annotation update)
01-MAR-2001 (TrEMBLrel. 16, Last annotation update)
00TER MEMBRANE PROTEIN GNA992.
Meningococcus by Whole-Genome Science 287:1816-1820(2000). SEQUENCE 526 AA; 54732 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPS4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q9JPS4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
           F543C4234AF807CA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
```

멍 Ω

Query Match Best Local S Matches 59

Similarity 100.0%; 159; Conservative 0;

9.8%;

Score 59; DB; Pred. No. 6.6

DB 2; 6.6e-

Length 526 Indels

.6e-50; s 0;

0 Gaps

```
RESULT
Q9JPI0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
Q9JPS1
                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
      Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                          01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                        Meningococcus by Whole-Genome Sequencing Science 287:1816-1820(2000).
EMBL; AF226384; AAF42533.1; -
EMBL; AF226362; AAF42511.1; -
EMBL; AF226363; AAF42512.1; -
                                                                                                                                                               Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P. Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., "Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
STRAIN=NGP165, 90/18311, AND 93/4286;
MEDLINE-20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDIJINE-20175756; pubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
MOXON F R. Grandi G. D. Saunders N.J., Granoff D.M., Venter C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup
Meningococus Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226380; AAF42559.1;
EMBL; AF226380; AAF42559.1;
SEQUENCE 530 AA; 55190 MW; 1F836CA57598515B CRC64;
                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                               GNA992
                                                                                                                                                                                                                                                                                                                                                                                                             OUTER MEMBRANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q9JPIO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q9JPI0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OUTER MEMBRANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q9JPS1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9JPS1
                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
nes 59; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 369
Ĺ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          U (TrEMBLrel. 15, 0 (TrEMBLrel. 15, 1 1 (TrEMBLrel. 16, 1
                                                                                                                                                                                                                                                                                                                                                                                                                      (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 16, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                            AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.8%;
                                                                            61520 MW;
                 9.8%;
100.0%;
                                                                                                                                                                                                                                                                                                                                                                  beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     beta subdivision; Neisseriaceae; Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Created)
                 Score :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                  subdivision; Neisseriaceae; Neisseria
                                                                            2B2A95D4868566A6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                 59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 2; 10, 6.6e-50; 0;
                 DB 2; L
7.2e-50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 530;
                               Length 589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                         cchi B.,
Nuti S.,
Zuo P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <del>.</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
```

```
Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
          Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q93QY1;
Q93QY1;
01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                                                           Q9JPS3;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                           EMBL; AF
                                                                                                                               MEDLINE-20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Aric Comanducci M., Jennings G.T., Baldi L., Bartolini E., Ca Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora Ratti G., Santini L., Savino S., Scarselli M., Storni E. Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tett Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., V Moyon F. B. Grandi G. Rannololi B.
                                                                                                                                                                                                                                                                                                             01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-MAR-2001 (TrEMBLrel. 16, Last annotation updat
00TER MEMBRANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peak I.R., Srikhanta Y., Dieckelman M., Moxon R "Identification and characterization of a gene membrane protein of Neisseria meningitidis."; Submitted (JUN-199) to the EMBL/GenBank/DDBJ dEMBL; AF157610; AAK68871.1; -. 1F1A80CD610CB230
                                                                                              Moxon E.R., Grandi G., Rappuoli R.;
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against
"Identification bu whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                              Q9JPS3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NHHA
                                                                                    Meningococcus by Whole-Genome Science 287:1816-1820(2000).
                                                                                                                                                                                                                            STRAIN-NGE28;
                                                                                                                                                                                                                                                                NCBI_TaxID=487;
                                                                                                                                                                                                                                                                              Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                          Neisseria meningitidis
                                                                                                                                                                                                                                                                                                       GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-P20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis
                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                       384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             384
                                                                                                                                                                                                                                                                                                                                                                                                                                            369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     369
                                                                                                                                                                                                                                                                                                                                                                                                       U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YDVNYGDALNYNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                                                                                                                                                                                                                                                                                                                                                                                                                                            YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 427
                                                           AF226378; AAF42527.1; -
VCE 590 AA; 61661 MW;
59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     59;
           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (TrEMBLrel. 19, (TrEMBLrel. 19, (TrEMBLrel. 19,
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                              PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9.8%;
          9.8%;
100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      beta subdivision; Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                              beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last sequence update)
Last annotation update)
0
          Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                              subdivision; Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1F1A80CD610CB230 CRC64;
                                                            8AA476AC300D80C8
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                   Giuliani M.M., Arico' B.
                                                                                                                                                                                                                                                                                                                                                                                590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 2;
3. 7.2e-50;
0;
           DB 2; I
7.3e-50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Moxon R.,
                                                                                                                                      , Mason T., Tettelin Granoff D.M., Venter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A
                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   databases
                                                                                                           Serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
0;
                      Length 590;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          encoding
                                                            CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Jennings
Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                        Capecchi
                                                                                                                                      ttelin H.,
Venter C.,
                                                                                                                                                                         apecchi B.,
M., Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          þ
                                                                                                                                                               Zuo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .
P.
                                                                                                                                                           יש:
;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            outer
0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
```

Ş

밁

PRELIMINARY;

PRT;

591

Ą

428 442

```
В
                                                                                                                                                                                                                                                                                                                                                                                                          Š
              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 59
                                     Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                      Q93QY3;
Q1-DEC-2001 (TrEMBLrel. 19, Q
01-DEC-2001 (TrEMBLrel. 19, Q
01-DEC-2001 (TrEMBLrel. 19, Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226366; AAF42515.1; -.
                                                                                              Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennii
"Identification and characterization of a gene encoding
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases
EMBL; AF157606; AAK68867.1; -.
SEQUENCE 591 AA; 62048 MW; CODC600798859C65 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9JPS7;
                                                                                                                                                                         STRAIN=EG329;
                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                          Bacteria;
                                                                                                                                                                                                                                                                                                                       Q93QY3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-BZ147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis.
Bacteria; Proteobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-OCT-2000
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-OCT-2000
                                                                                                                                                                                                            NCBI_TaxID=487;
                                                                                                                                                                                                                                    Neisseria meningitidis
                                                                                                                                                                                                                                                  NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                     372
              384
                                                                                                                                                                                                                                                                                                                                                                                                            384
                                                Local
YDVNYGDALNYNQLQNSGWNLDSKAVAGSSGKYISGNYSPSKGKMDETVNINAGNNIEI 442
                                                                                                                                                                                                                                                                                                                                                                                   YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 430
                                                                                                                                                                                                                                                                                                                                                                                                            YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                                      l Similarity
59; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                    l Similarity
59; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Proteobacteria;
                                                                                                                                                                                                                         Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                 9.8%;
ilarity 100.0%;
Conservative (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (TrEMBLrel. 15, (TrEMBLrel. 15, (TrEMBLrel. 19,
                                   9.8%; S
llarity 100.0%;
Conservative 0;
                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           beta
                                                                                                                                                                                                                         beta
                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                     Score 59; DB; Pred. No. 7.3
                                                                                                                                                                                                                                                                                               Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 59; DB Pred. No. 7.3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                       Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Last
                                                                                                                                                                                                                        subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               533453CAE5A91E1F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sequence
                                                                                                                                                                                                                                                                                                                         591
                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2; L...
o. 7.3e-50;
0;
                                 DB 2;
5.7.3e-50;
0;
                                                                                                                                                                                                                                                                                                                       AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         update)
                                                          Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 591;
                                                                                                                                                           Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                     Indels
                                                                                                                                                þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Zuo P.,
                                                                                                                                                 novel
                                                                                                                                                             ×
                                                                                                                                                                                                                         Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Chi B.,
Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                      0,
                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                   Gaps
                                                                                                                                                 outer
                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                      0,
```

δÃ

Query Match Best Local S Matches 59

Similarity

9.8%;

Conservative

0;

Score 59; DB Pred. No. 7.3 0; Mismatches

7.3e-50; hes 0;

0,

Gaps

0

DB 16;

Length Indels

밁

372 384

```
RESULT
Q9JR18
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q9JR18
Q9JR18;
Q1-OCT-2000
01-OCT-2000
                            EMBL;
EMBL;
EMBL;
EMBL;
EMBL;
TIGR;
                                                                                                                                                                                                                                                                          Tettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., Nelson Eisen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J., Nelson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K., Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Dougherty B Mason T., Ciecko A., Parksey D.S., Blair E., Cittone H., Clark E., Cotton M.D., Utterback T.R., Khouri H., Qin H., Vamathevan J., Gill J., Scarlato V., Masignani V., Pizza M., Grandi G., Sun L., Smith H.O., Fraser C.M., Moxon E.R., Rappuoli R., Venter J.C., "Complete genome sequence of Neisseria meningitidis serogroup B s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-0CT-2000 (TrEMBLrel. 15, Cr
01-0CT-2000 (TrEMBLrel. 15, La
01-DEC-2001 (TrEMBLrel. 19, La
0UTER MEMBRANE PROTEIN GNA992
                                                                                                                                   "Identification and characterization of a gene encoding membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P. Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C. Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
STRAIN-MCS8 / SEROGROUP B, BZ169, BZ83, AND H44/76;
MEDLINE-20175756; PubMed-10710308;
MEDZIA W., Scarlato V., Masignani V., Giuliani M.M., Aric
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Ca
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora
                                                                                                                                                                                                                                                             MC58."
                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=MC58 / SEROGROUP B;
MEDLINE=20175755; PubMed=10710307;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Meningococcus by Whole-Genome Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GNA992
SEQUENCE
                                                                                                                        EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROTEIN).
                                                                                                                                                                                     Peak I.R., Srikhanta Y., Dieckelman M.,
                                                                                                                                                                                                 SPECIES=N.meningitidis; STRAIN=PMC21;
                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                              Science 287:1809-1815(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   372 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                           AF226375; AAF42524.1; AE000450; AAF41395.1; AF226367; AAF42516.1; AF226370; AAF42519.1; AF226374; AAF42523.1; AF157611; AAK68872.1; AMB0992; AMB0992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OR
              proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               meningitidis, and meningitidis (serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Proteobacteria; beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NMB0992 OR
                                                                                                                                                                                                                                                                                                                                                                                                                                                  N.A.
AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    491;
62112 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation update)
92 (ADHESIN) (NHHA OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequencing. ";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               oup B).
subdivision;
7C22F3CAE7F73EC6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bartolini E., Capecchi
                                                                                                                                                                   Moxon R., Jennings
a gene encoding a r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Arico'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3
                                                                                                                                                                                                                                                                                                                                                                                                     Nelson K.E.,
                                                                                                                                                                      novel
                                                                                                                                                                                     M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Chi B.,
Nuti S.,
                                                                                                                                                                                                                                                                              strain
                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                      outer
                                                                                                                                                                                                                                                                                                                                          .в.,
```

```
RESULT 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORAGENIA PRO ORAGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q9JPS9
ID Q9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q9AQF0;
01-JUN-2001
01-JUN-2001
01-JUN-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C. Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peak I.R., Srikhanta Y., Dieckelman M., Moxon E.R., Jenn "Identification and characterisation of a gene encoding a membrane protein of Neisseria meningitidis.";
Submitted (FEB-199) to the EMBL/GenBank/DDBJ databases.
EMBL; AF125375; AAK09243.1;
SEQUENCE 592 AA; 62290 MW; 168986A97381EFC5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Meningococcus by Whole-Genome Sequencing. Science 287:1816-1820(2000). EMBL; AF226361; AAF42510.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9AQF0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=860800;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OUTER MEMBRANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SSAL60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=MC58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OUTER MEMBRANE PROTEIN.
                                                                                                                                                                          372
                                                                                                                                                                                                          384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
                                                                                                                                                                          YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKYISGNVSPSKGKMDETVNINAGNNIEI 430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9.8%;
nilarity 100.0%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             592 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                               9.8%;
ilarity 100.0%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             42510.1; -.
61917 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     17,
17,
17,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                   0,
                                                                                                                                                                                                                                                                                                                                                Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subdivision; Neisseriaceae; Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4A3471514FD3C879 CRC64;
                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               592
                                                                                                                                                                                                                                                                                                                                                DB 2; L
7.3e-50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB
7.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Granoff D.M., Venter C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7.3e-50;
es 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ĀĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                 Length 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ×
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              в.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . P. ;
                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                               0;
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9JQW4;
Q9JQW4;
01-OCT-2000
01-OCT-2000
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q93QY2;
Q93QY2;
01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                           Parkhill J., Achtman M., James K.D., Bentley S.D., Churcher C., Klee S.R., Morelli G., Basham D., Brown D., Chillingworth T., Davies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Holroyd Jagels K., Leather S., Moule S., Mungall K., Quail M.A., Rajandream M.A., Rutherford K.M., Simmonds M., Skelton J., Whitehead S., Spratt B.G., Barrell B.G.;

"Complete DNA sequence of a serogroup A strain of Neisseria meningitidis 22491.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peak I.R., Srikhanta Y., Dieckelman M., Moxon R "Identification and characterization of a gene membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ d EMBL, AF157609; AAK68870.1;
                                                      Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi Galeotti C.L., Luzzi E., Marchetti R., Marchetti E., Mora M., Nu' Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo I Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter (Moxon E.R., Grandi G., Rappuoli R.; Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
Meningococcus by Whole-Genome (
Science 287:1816-1820(2000).
EMBL; AL162755; CAB84461.1; -.
EMBL; AF226357; AAF42506.1; -.
EMBL; AF226365; AAF42514.1; -.
                                                                                                                                                                            SEQUENCE FROM N.A.
STRAIN=205900, BZ133, F6124, AND Z2491;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                     Nature
[2]
                                                                                                                                                                                                                                                                                                                                                        STRAIN=Z2491 / SEROGROUP A / SEROTYPE 4A;
MEDLINE=20222556; PubMed=10761919;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PUTATIVE SURFACE F
NMA1200 OR GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NHHA OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=65699,
                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis (serogroup A), Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NHHA.
                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12
                                                                                                                                                                                                                                     404:502-506(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (TrembLrel. 19, 0
(TrembLrel. 19, 1
(TrembLrel. 19, 1
MEMBRANE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (TIEMBLrel. 15, Created)
(TIEMBLrel. 15, Last sequence update)
(TIEMBLrel. 19, Last annotation update)
RPACE FIBRIL PROTEIN (OUTER MEMBRANE PRO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA;
                                                                                                                                                                                                                                                                                                                                                                                                                  487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                beta subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 59; pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               F9403A0B4A18EEA7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                592
                                                                                                                                                                                                                                                                                                                                                                                                                                                           and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 2; L
7.3e-50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R
'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ×
                                                                                                                                        Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .
P.;
                                                                                                                      ₽.,
                                                                                                  ი
                                                                                                                                                       В.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   442
```

```
RESULT
Q9JPI3
ID Q9
AC Q9
DT Q9
DT Q9
DT Q9
OT Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RP SEQUENCE FROM N.A.

SEQUENCE FROM N.A.

SETRAIN-NG3/88, AND BZ232;

RX MEDLINE-20175756; PubMed-10710308;

RA Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

RA Comanducci M., Jonnings G.T., Baldi L., Bartolini E., Capecchi B.,

RA Comanducci M., Junnings G.T., Baldi L., Marchetti E., Mora M., Nuti S.,

RA Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

RA Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

RA Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

RA Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).

DR EMBL; AF226396; AAF42525.1; -.

EMBL; AF2263976; AAF42518.1; -.

EMBL; AF2263976; AAF42518.1; -.

EMBL; AF2263976; AAF42518.1; -.

EMBL; AF226396 AAF42518.1; -.
  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SQ KW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                 Q9JPS2;
Q9JPS2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-MAR-2001 (TrEMBLrel. 16, 01-MAR-2001)
MEDLINE=20175756; PubMed=10710308; Pizza M., Scarlato V., Masignani V., Comanducci M., Jennings G.T., Baldi
                                                                                                                                        Neisseria meningitidis.
Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                                                                                                                                                                                          01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-MAR-2001 (TrEMBLrel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OUTER MEMBRANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Complete proteome. SEQUENCE 592 AA;
                                                                           STRAIN=NGE31
                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                   GNA992
                                                                                                                                                                                                                                       OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPI3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9JPI3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    372 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI
                                                                                                                                                                                                                                                                                                                                                                                                       14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AF226373; AAF42522.1; AF226386; AAF42535.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     592 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9.8%;
ilarity 100.0%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.8%;
llarity 100.0%;
Conservative
                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                       PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61745
                                                                                                                                                                                                                                       GNA992
                                                                                                                                                                beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MW;
                                                                                                                                                                                                                                                        Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . .
                                                                                                                                                                                                                                                                                                        Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 59; DB; Pred. No. 7.3
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 59; DB Pred. No. 7.3 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                  subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AD22E2F5EEF8F754 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence update)
  Giuliani M.M., A
L., Bartolini E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 2; L, 7.3e-50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7.3e-50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
                                                                                                                                                                                                                                                                                                                                                       AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseriaceae; Neisseria
                                                                                                                                                                  Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
  Arico' B.,
., Capecchi
                                                                                                                                                                  Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       chi B.,
Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
    В.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
```

Search Job tir

completed: ne: 221 sec

July

Ψ

2002,

08:34:10

time:

```
09JPH7
09JPH7
00 AC
00 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 59
                                                                                                    Query Match
Best Local S
Matches 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C STRAIN=BZ198, AND 297-0;

X MEDLINE=20175756; PubMed=10710308;

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

A Caleotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti,

A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuoo P.,

A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

A MOXON E.R., Grandi G., Rappuoli R.;

T "Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9JPH7;
01-OCT-2000
01-OCT-2000
                                                                                                                                                                                                                               Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings "Identification and characterization of a gene encoding a nembrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF226368; AAF42517.1; -.
EMBL; AF226358; AAF42507.1; -.
EMBL; AF226358; AAF42507.1; -.
EMBL; AF2757604; AAK68865.1; -.
EMBL; AF2757604; AAK68865.1; -.
EMBL; AF2757604; AAK68865.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Meningococcus by Whole-Genome Sequencing Science 287:1816-1820(2000).
EMBL; AF226379; AAF42528.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti Ratti G., Santini L., Savino S., Scarselli N., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         оэлрн7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=BZ198;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               384 YDVNYGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
  374
                                                      384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity hes 59; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15
YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI
                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   594 AA;
                                                                                                    9.8%;
ilarity 100.0%;
Conservative (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9.8%;
llarity 100.0%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      rEMBLrel. 15, Last sequence update) rEMBLrel. 19, Last annotation updat PROTEIN GNA992 (NHHA OUTER MEMBRAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62114 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15,
19,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0,
                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 59; DB Pred. No. 7.3 0; Mismatches
                                                                                                       Score 59; DB
Pred. No. 7.3
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1E2A63A78F53D256 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         notation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
5. 7.3e-50;
0;
                                                                                            DB 2;
5. 7.3e-50;
0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 594;
                                                                                                                                                     Length
                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Tettelin H.,
                                                                                                                                                             594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Capecchi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Venter C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nuti S.,
                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                          0;
```

```
RESULT
AAU06186
 В
                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 12; Fig 8; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        preventing broad spectrum of Neisseria meningitidis
                                                                                                                                  Protein
                                                                                                                                                                                             Synthetic.
                                                                                                                                                                                                                                 mutant;
                                                                                                                                                                                                                                                                   N. meningitidis PMC21 NhhA deletion mutant #4.
                                                                                                                                                                                                                                                                                            24 -OCT-2001
                                                                                                                                                                                                                                                                                                                                             AAU06186 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N-PSDB; AAS09175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-JAN-2001;
25-JAN-2000; 2000US-0177917.
                         25-JAN-2001; 2001WO-AU00069
                                                 02-AUG-2001.
                                                                         WO200155182-A1.
                                                                                                                                                                                                        Neisseria meningitidis strain PMC21
                                                                                                                                                         Peptide
                                                                                                                                                                                                                                                                                                                                                                                                    G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2001-488774/53.
                                                                                                                                                                                                                                 e antigen
; mutein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity 59; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                433 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   9.8%;
ilarity 100.0%;
Conservative
                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2001WO-AU00069
                                                                                                                                                                                                                                           NhhA;
                                                                                              /label= Signal_peptide
50..502
                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                            meningococcal disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 59; DB; Pred. No. 1.3: 0; Mismatches
                                                                                                                                                                                                                                                                                                                                             502
                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 22; 1
                                                                                                                                                                                                                                           meningitis vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 433;
                                                                                                          specifically
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
```

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                  AAU06182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antiqen NihA (AAU06182-AAU06186). The modified or mutant NihA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antiqen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treat preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                  Surface antigen NhhA; meningococcal mutant; mutein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 12; Fig 9; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WPI; 2001-488774/53.
N-PSDB; AAS09176.
                                                                                                                                                                                                                     Key
                                                                                                                                                                                                                                                                                                                         N. meningitidis
                                                                                                                                                                                                                                                                                                                                                   24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                           AAU06182;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                             Protein
                                                                                                                                                                                                      Peptide
                                                                                                                                                                                                                                              Synthetic
                                                                                                                                                                                                                                                          Neisseria meningitidis strain PMC21
                                                                                                                                                                                                                                                                                                                                                                                                      AAU06182 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (UYQU ) UNIV QUEENSLAND
                                                                                                                WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Jennings MP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      502 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                         PMC21 NhhA deletion mutant #1.
                                                                                                                                                                               /label= Signal_peptide
52..512
                                                                                                                                        /label= mature_NhhA_deletion_mutant_#1
/note= "Predicted mature protein, spec
    claimed in claim 12"
                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9.8%; sc.,
, 100.0%; Pr
                                                                                                                                                                                                                                                                                                                                                                                                        512 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                  disease; meningitis vaccine,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.5e-49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 502;
                                                                                                                                                       specifically
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ö
```

0;

(UYQU ) UNIV QUEENSLAND 25-JAN-2000; 2000US-0177917 25-JAN-2001; 2001WO-AU00069

w

```
RESULT
AAU06184
                                                                                                                                                                                                                                                                                                                                                                             80
                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FW0200066741-A2
                                                                                                                                  mutant; mutein
                                                                                                                                                                 N. meningitidis
                                                  Protein
                                                                                 Key
                                                                                                     Synthetic
                                                                                                              Neisseria
                                                                                                                                              Surface
                                                                                                                                                                                      24-OCT-2001
                                                                                                                                                                                                           AAU06184;
                                                                                                                                                                                                                              AAU06184 standard;
                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                        The present peptide is a conserved region of a Neisserial protein. Neisserial proteins containing this sequence, and the nucleic acids that encode such proteins, are useful in the manufacture of medicines for the prevention of Neisserial infection, and in the manufacture of
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 15; Page 57; 157pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Novel Neisserial protein fragments and their corresponding nucleic acids, useful in the manufacture of medicines for the prevention of Neisserial infection, and in the manufacture of diagnostic reagents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WPI; 2000-687543/67.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30-APR-1999;
09-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         09-NOV-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene therapy;
                                                                     Peptide
                                                                                                                                                                                                                                                                                                                                                                                               multi-specific diagnostic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rappuoli R;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (CHIR-) CHIRON SPA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    28-APR-2000; 2000WO-IB00642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria meningitidis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisserial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        26-FEB-2001
                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                   ω
                                                                                                                                            antigen NhhA; meningococcal disease; meningitis vaccine;
                                                                                                              meningitidis strain PMC21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 conserved peptide #13
                                                                                                                                                                                                                                                                                                                                                                            72 AA;
                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2000GB-0005728
                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    conserved sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99GB-0010168
                /label= Signal_peptide
52..407
//label= Mature_NhhA_deletion_mutant_#2
/note= "Predicted mature protein, spec.
claimed in claim 12"
                                                                                                                                                                 PMC21 NhhA deletion mutant #2
                                                                             Location/Qualifiers
                                                                                                                                                                                                                             Protein;
                                                                                                                                                                                                                                                                                                                                  9.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria
                                                                                                                                                                                                                                                                                                                                                                                               reagents.
                                                                                                                                                                                                                              407
                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                    Score 59;
Pred. No.
                                                                                                                                                                                                                              ΑA
                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gonorrhoeae; antibacterial;
                                                                                                                                                                                                                                                                                                                                DB 21; 1
2.6e-50;
                                                                                                                                                                                                                                                                                                                                          Length 72;
                            specifically
                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                        0;
```

WO200155182-A1

02-AUG-2001

```
AAU06185
В
                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                           RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06185). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen.
                                      WO200155182-A1
                                                                                                                                                                                                              Surface antigen mutant; mutein.
                                                                                                                                                                                                                                                    N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                       Protein
                                                                                                                                                                       Synthetic
                                                                                                                                                                                     Neisseria meningitidis strain PMC21
                                                                                                                                                                                                                                                                               24-OCT-2001
                                                                                                                                                                                                                                                                                                          AAU06185
                                                                                                                                                                                                                                                                                                                                  AAU06185 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                antigen NhhA deletion mutant #2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 12;
                                                                                                                                 Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N-PSDB; AAS09174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       25-JAN-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                               384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
                                                                                                                                                                                                                                                                                                                                                                                                188 ydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmdetvninagnniei 246
                                                                                                                                                                                                                                                                                                                                                           4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                      59;
                                                                                                                                                                                                                           antigen NhhA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Fig 7; 91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      407 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2001WO-AU00069
                                                             /label= Signal_peptide
52..433
/label= Mature_NhhA_deletion_mutant_#3
/note= "Predicted mature protein, spec:
claimed in claim 12"
                                                                                                                                                                                                                                                       PMC21
                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                  Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9.8%;
                                                                                                                                                                                                                           meningococcal disease; meningitis vaccine,
                                                                                                                                                                                                                                                     NhhA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    English.
                                                                                                                                                                                                                                                     deletion mutant #3
                                                                                                                                                                                                                                                                                                                                  433
                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 59; DB Pred. No. 1.2 0; Mismatches
                                                                                                                                                                                                                                                                                                                                  ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 22; 1
1.2e-49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                            specifically
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             or
```

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Post-processing: Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Word size
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein -
                                                                                                                                                                                                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                  Score
protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A_Geneseq_032802:*
1: /SIDS1/gcgdata/h
2: /SIDS1/gcgdata/h
3: /SIDS1/gcgdata/h
4: /SIDS1/gcgdata/h
5: /SIDS1/gcgdata/h
6: /SIDS1/gcgdata/h
7: /SIDS1/gcgdata/h
8: /SIDS1/gcgdata/h
                                                                                                                                                                                                                                                                                  Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  10:
11:
12:
13:
13:
14:
15:
16:
17:
17:
18:
19:
20:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1981.DAT: *
2: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1981.DAT: *
3: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1982.DAT: *
4: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1983.DAT: *
5: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1983.DAT: *
5: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1984.DAT: *
5: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1985.DAT: *
7: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1986.DAT: *
8: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DAT: *
9: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1989.DAT: *
10: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1989.DAT: *
11: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1989.DAT: *
12: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1991.DAT: *
13: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1992.DAT: *
14: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1993.DAT: *
15: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1993.DAT: *
16: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DAT: *
17: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DAT: *
18: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DAT: *
19: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1996.DAT: *
20: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1996.DAT: *
21: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1996.DAT: *
22: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
23: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
24: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
25: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
26: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
27: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
28: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
29: \SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    July 3, 2002, 08:12:39 ; Search time 34.02 Seconds (without alignments) 1972.033 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OLIGO
                                                                                           77.6
9.8
9.8
9.8
9.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-771-382-11
604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         747574 seqs, 111073796 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapop 60.0 , Gapext 60.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MNXIXRIIWNSALNAWVXVS.....TASGNSRGHFGXSASVGYQW
                                                                                                                                                                                                                                                                                  Length
                                                                604
72
407
433
502
512
513
                                                                                                                                                                                                                                                                                  DB
                                                                                                                                                                                                                                                                                  H
                   AAU06186
AAU06183
AAU06183
AAY23745
AAU06173
AAY27202
                                                                                                                                                                               AAU06181
AAB37830
AAU06184
                                                                                                                                                              AAU06185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sw model
                                                                                                                                                                                                                                                                                                                                                     SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              747574
                                N. meningitidis su
Neisserial conserv
N. meningitidis PM
N. meningitidis PM
N. meningitidis PM
N. meningitidis PM
N. meningitidis H4
A surface protein
                                                                                                                                                                                                                                                                             Description
                 Amino acid sequenc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60,
```

13	14	. 16	16	17	19	19	19	20	26	26	ω	43	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
2.2					٠		٠				٠		٠	٠		٠									٠							
15 2353	20	16	16	1094	1098	19	19	20	245	56	116	53	599	599	598	598	598	598	594	594	594	594	594	592	592	592	592	592	591	591	591	591
17	21	21	21	21	17	21	21	21	20	21	21	21	22	20	22	22	20	20	22	22	21	20	20	22	22	20	20	20	22	22	21	20
AAB37825 AAR99393	3782	3782	AAB37819	385	939	5	15	37	27	$\frac{\omega}{1}$	AAB37832		AAU06176	AAY23743	AAU06178	AAU06177	AAY23742	AAY23738	AAU06179	AAU06174	~	23	AAY23739	618	AAU06172	237	AAY23737	720	AAU06175	0617	Y570	AAY23746
Neisserial conserv Haemophilus adhesi		Neisserial conserv	Neisserial conserv		Haemophilus adhesi	homolog	Ŏ	erial	d	1	Neisserial conserv	Neisserial conserv			-	itidis	A surface protein	prote	N. meningitidis BZ	N. meningitidis EG	=	A surface protein	A surface protein	N. meningitidis 22	N. meningitidis H4	A surface protein	face pr	Amino acid sequenc	N. meningitidis EG	. meningitidi	amino ac	A surface protein

## ALIGNMENTS

RESULT AAU06181 ID AAU

AAU06181 standard; Protein;

604

Ā

24-OCT-2001 (first entry)

AAU06181;

```
THE THEFT IN THE TENT OF THE T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Key
Region
                                                                                                                                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Surface antigen NhhA; meningococcal disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N. meningitidis surface antigen NhhA consensus polypeptide sequence
        Region
                                                                                                                         Region
                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                        /note=
71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           43
/label= V2
/note= "Variable region
135...198
                                                                                                                                                                                                                                                                                                                                                                                                                                          51..108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                           note= "Encoded by GNN" 109..120
                                                                                                                                                                                                                                                                                                                                                                                                     /label- v1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Encoded by AGN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 'note=
                                                                                                                             21..134
                                                                                                                                                              note- "Conserved region
                                                                                                                                                                                                           'label= C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'note= "Encoded by NTG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ′label≈ C1
                                                                                                                                                                                                                                                                                                                                                         "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitis vaccine
```

surface protein

```
TO THE PART OF THE PROPERTY OF
                                           New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for t preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
             Claim 10;
                                                                                                              N-PSDB; AAS09171
                                                                                                                                                                                                                            25-JAN-2000;
                                                                                                                                                                                                                                                             25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                              02-AUG-2001
                                                                                                                                                                                                                                                                                                                               WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                               Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                              Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                               Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                              2001-488774/53.
                                                                                                                                                                                             UNIV
            Fig 1; 91pp; English
                                                                                                                                                           Jennings MP
                                                                                                                                                                                            QUEENSLAND
                                                                                                                                                                                                                            2000US-0177917.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label= C3
/note= "Con
> 174
                                                                                                                                                                                                                                                                                                                                                                               /note=
603
                                                                                                                                                                                                                                                                                                                                                                                                                                               /note-
573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Encoded 543
                                                                                                                                                                                                                                                                                                                                                                                                              /note=
583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "Encoded 567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note=
548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "Encoded by 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= Unknown
/note= "Encoded
249..604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "Encoded 236"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note=
234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note=
229..23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "Conserved region 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= "Variable region 247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Encoded by 226..227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Conserved region 224"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label= V3
/note= "Variable region
221..239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= "Encoded
199..220
                                                                                                                                                                                                                                                                                                                                                                 /note-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    note= "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  note= "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . 230
                                                                                                                                                                                                                                                                                                                                                                                           "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Encoded by TINAAN"
                                                                                                                                                                                                                                                                                                                                                                "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  c5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ٧4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  bу
                                                                                                                                                                                                                                                                                                                                                                                                                            Ьy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ьy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               þу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                             bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 þу
                                                                                                                                                                                                                                                                                                                                                                CAN"
                                                                                                                                                                                                                                                                                                                                                                                             AAN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                               TAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NTG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NTN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CAN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTN"
                                                                                                                                                                                                                                                                                                                                                                                                                                AGN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TTN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TCN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AANGAN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ហ្ម
                                                            treating
                                                              ဝင္ပ
```

RESULT AAB37830 ID AAB3

standard;

Peptide;

72

N

XXXX

AAB37830;

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                  Qy
                                                                                            밁
                                                                                                                ΩV
                                                                                                                                            밁
                                                                                                                                                               Qy
                                                                                                                                                                                           밁
                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                  뭥
                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
 망
                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present sequence represents N. meningitidis surface antigen NhhA consensus polypeptide sequence. The wild type NhhA polypeptide sequences (AAUU6171-AAUU6180) from 10 different N. meningitidis strains are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                   121
 601
                      601
                                             541
                                                                                            481
                                                                                                                                            421
                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                    481
                                                                                                                                                                  421
                                                                                                                                                                                           361
                                                                                                                                                                                                                361
                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GXTXXXXXNVDFVXTYDTVEFLSADTKTTTVNVESKDNGKXTEVKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                  GYOW 604
                                                                                          TFASGXGTTATVSKDDQGNITVXXDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN
                                                                                                                                                                                                                                                 VTGKXKXENXSSTDXGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGOADKFETVTSGTXV
                                                                                                                                                                                                                                                                                                                                                                                            XXXXXXXXXXXXXTYSLKKXLXXLXXVXTEKLSFXANXXKVNIXSDTKGLNFAKXTAX 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               given
gygw
                                                                                                                                          gxtxxxxxnvdfvxtydtveflsadtktttvnveskdngkxtevkigaktsvikekdgkl
                                                                                                                                                                                                                                                                                                                                                                                   xxxxxxxxxxxxxftyslkkxlxxlxxvxteklsfxanxxkvnixsdtkglnfakxtax
                                                                                                                                                                   VSPSKGKMDETVNINAGNNIEIXRNGKNIDIATSMXPQFSSVSLGAGADAPTLSVDXXXA
                                                                                                                                                                                         tfasgxgttatvskddqgnitvxydvnvgdalnvnqlqnsgwnldskavagssgkvisgn
                                                                                                                                                                                                                                       vtgkxkxenxsstdxgeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtxv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          604 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          77.6%; Scu
/ 100.0%; Pr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                present
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 469;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ВВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                  180
                                                600
                                                                     600
                                                                                            540
                                                                                                                    540
                                                                                                                                            480
                                                                                                                                                                   480
                                                                                                                                                                                           420
                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
```

```
RESULT :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SSSSSSSSSSSSSX & G
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 9.8%; Score 59; DB Best Local Similarity 100.0%; Pred. No. 1.7 Matches 59; Conservative 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain PMC21 is 1 of 10 NhhA polypeptide sequences (AAU06180) from 10 different N. meningitidis strains given in
                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                      Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                              N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAU06175 standard; Protein; 591 AA
                                                                               Region
                                                                                                                                                  Region
                                                                                                                                                                                    Region
                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis strain EG329.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAU06175;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                  WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         present
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                             EG329 surface antigen NhhA polypeptide sequence
                                                                              /label= V4
/note= "Variable
237..591
                                                                                                                                                                                                                                                                                          /note= "\
109..120
                                                                                                                                                                                   /note= "Conserved
189..210
                                                                                                                                                                                                                                                                                                                               51..108
                                                                                                                 230..236
                                                                                                                           /label= C4
/note= "Conserved
                                                                                                                                                   211..229
                                                                                                                                                                                                                                           /label= v2
                                                                                                                                                                                                                                                                                                               /label= V1
                                                                                                                                                                                                                                                                                                                                      /label= C1
/note= "Conserved region
                                                                    /label=
                                                                                                                                                             note= "Variable"
                                                                                                                                                                         'label=
                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                  'note=
                                                                                                                                                                                                                                                                 note= "Conserved region
                                                                                                                                                                                                                                                                                 /label=
                                                                                                                                                                                                                                                                                                                                                                           ocation/Qualifiers
                                                                                                                                                                                                                                                        21..124
                                                                                                                                                                                                                       . 188
                                                                                                                                                                                                                                                                                                    "Variable region
                                                                                                                                                                                                                                 "Variable region
                                                      "Conserved region
                                                                                                                                        C4
                                                                                                                                                                                                            ဌ
                                                                                                                                                                                                                                                                                 C2
                                                                                         region
                                                                                                                                                             region
                                                                                                                         region
                                                                                                                                                                                              region
                                                                                                                                                                                                                                  ນ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1.7e-49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
```

Search completed: July Job time: 1053 sec

ω

2002, 08:30:12

망

```
δõ
                                                                                                                                                                 Query Match
Best Local S
Matches 59
                                                                                                                                                                                                             The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain EG329 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in the present inventor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI; 200
N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (UYQU ) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                25-JAN-2001; 2001WO-AU00069
2001-488774/53.
DB; AASO9165.
                                                                       Ch 9.8%; Score 59; DB 22; Similarity 100.0%; Pred. No. 1.7e-49; 59; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Fig 1; 91pp; English
                                                                                                                                                                 591
                                                                                                                                                                                                    invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ϋ́
                                                                                                        Length 591;
                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               treating or
                                                                         0;
                                                                         Gaps
```

```
OM protein - protein search, using sw model
                                                                                    GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
```

Run on: July 3, 2002, 08:30:39; Search time 13.48 Seconds (without alignments) 1734.912 Million cell updates/sec

Title:
Perfect score:
Sequence: US-09-771-382-11 604

Scoring table: MNXIXRIIWNSALNAWVXVS.....TASGNSRGHFGXSASVGYQW 604

OLIGO Gapop 60.0 , Gapext 60.0

Searched: 105224 seqs, 38719550 residues

Word size :

Total number of hits satisfying chosen parameters:

105224

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Listing first 45 summaries

Database : SwissProt\_40:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Result No.
7777777777777777777777777777777	Score
	Query Match I
1990 1990 1990 1000 1000 1000 1000 1000	Length DB
SODC_ACTPL SODC_HAEDA SODC_HAEDA SODC_HAEDA SODC_HAEDA SODC_HAEDA SODC_HAEDA YAOD_SCHPO YADA YAOD_CAEDA YADA YAOD_CAEDA YAODA YAODA YADA YAODA YADA YAODA Y	ID
CLACTPL CCTACE C	200
P247002 P247002 Q59452 Q59487 Q592087 Q592087 Q59219 Q55244 Q693219 P25842 Q049022 Q049022 Q0490337 Q61937 P13084 P21135 P481135 P481135 P481135 P56252 P57829 P578	Descr
actinn actinn synecl actinn synecl actinn synecl acothe haemon mus mycop. mus mycop. mus mycop. mus chiox schiox schiox cyanon caenon mus human human human human human human human mus m fowlp methal	î j
philus philus philus philus phococc pacter philus p	

45	44	43	42	41	40	39	38	37	36	35	34
σ	6	6	Q	7.	7	7	7	7	7	7	7
1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
56	55	51	48	3092	1714	1108	1103	835	796	740	739
۲	٢	$\vdash$	_	_	_	Ľ	ب	_	۲	_	_
RL33_RICPR	YHFL_ECOLI	R27A_METTH	YK82_ARCFU	IRA1_YEAST	SYEP_DROME	EMBA_MYCAV	VG37_BPAR1	GLND_STRCO	YFC3_YEAST	PURL_LACCA	PURL_LACIC
Q9zc89 rickettsia			028197 archaeoglob			P71485 mycobacteri			P43573 saccharomyc	P35852 lactobacill	Q9zb06 lactococcus

## ALIGNMENTS

					, and a second	SULT
MBL; AE006 MBL; A2102 SSP; P24710 nterPro; I fam; PF000 roDom; PF000 ROSITE; PS xidoreduct IGNAL HAIN ETAL	his SWISS-PROT entry is copyright. It is produced through a etween the Swiss Institute of Bioinformatics and the EMB he European Bioinformatics Institute. There are no restrise by non-profit institutions as long as its content is odified and this statement is not removed. Usage by and nitities requires a license agreement (See http://www.isb-sirsendanemail to license@isb-sib.ch).	CÈLLS AND ARE TOXIC TO BIOLOGICAL SYSTEMS (BY SIMILARITY).  - CATALYTIC ACTIVITY: 2 superoxide + 2 H(+) = O(2) + H(2)O(2).  - COFACTOR: Copper and zinc.  - SUBUNIT: HOWODIMER (BY SIMILARITY).  - SUBURIT: HOWODIMER (BY SIMILARITY).  - SUBCELLULAR LOCATION: Periplasmic (By similarity).  - SIMILARITY: BELONGS TO THE CU-ZN SUPEROXIDE DISMUTASE FAMILY.	5; 9611 8.; al { al { euk logy	[1] SEQUENCE FROM N.A. STRAIN=PM70; MEDLINE-21145866; PubMed-11248100; MEDLINE-21145866; PubMed-11248100; MEDLINE-21945866; PubMed-11248100; MAY B.J., Zhang Q., Li L.L., Paustian M.L., Whittam T.S., Kapur V.; "Complete genomic sequence of Pasteurella multocida Pm70."; "Proc. Natl. Acad. Sci. U.S.A. 98:3460-3465(2001). [2] [2] SEQUENCE OF 87-173 FROM N.A.		LT 1

```
RESULT
SODC_AC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches
                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN=S 4074 / SEROTY
Helie M.C., Sirois M.,
Submitted (JUN-1996) 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           METAL
METAL
METAL
METAL
METAL
METAL
METAL
METAL
METAL
CONFLICT
SEQUENCE
   MEDLINE-20124004; PubMed-10656823;
POTEST K.T., Langford P.R., Kroll J.S., Getzoff E.D.;
"Cu,Zn superoxide dismutase structure from a microbial establishes a class with a conserved dimer interface.";
J. Mol. Biol. 296:145-153(2000).
-i- FUNCTION: DESTROYS RADICALS WHICH ARE NORMALLY PRODUCTION: DESTROYS RADICALS WHICH ARE NORMALLY PRODUCTION AND ARE TOXIC TO BIOLOGICAL SYSTEMS.
-i- CATALYTIC ACTIVITY: 2 superoxide + 2 H(+) = O(2) +
-i- COPACTOR: COpper and zinc.
                                                                                                                                              from the eukaryotic enzyme, and not so rare after all!"; Microbiology 141:2271-2279(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SODC_ACTPL STANDARD; PRT; 190 AA. P24702; Q59135; 01-MAR-1992 (Rel. 21, Created) 01-NOV-1997 (Rel. 35, Last sequence update) 01-MAR-2002 (Rel. 41, Last annotation update) Superoxide dismutase [Cu-Zn] precursor (EC 1.15.1.1).
                                                                                                                                                                                                        STRAIN-SEROTYPE III / ISOLATE 142
MEDLINE-96118708; PubMed=7496539;
                                                                                                                                                                                                                                                                          Loynds
"recf i
                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-SEROTYPE III / ISOLATE 1421 (NIELSEN);
MEDLINE-97101016; PubMed-8945543;
Langford P.R., Loynds B.M., Kroll J.S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACTPL
                                                                                                                                                                                  Kroll J.S., Langford P.R., Wilks K.E., Ke
"Bacterial [Cu, 2n] - superoxide dismutase:
                                                                                                                                                                                                                                                                                                 STRAIN=SEROTYPE III / ISOLATE 142
MEDLINE=92158680; PubMed=1741300;
                                                                                                                                                                                                                                                                                                                                                                                                               "Cloning and molecular characterization of Cu,Zn superoxide dismutase from Actinobacillus pleuropneumoniae."; Infect. Immun. 64:5035-5041(1996).
                                                                                                                                 X-RAY CRYSTALLOGRAPHY (1.9 ANGSTROMS).
                                                                                                                                                                                                                                                                Nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria; Actinobacillus.
                                                                                                                                                                                                                                     SEQUENCE OF 91-177 FROM
                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 180-190 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=715;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Actinobacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     294 KEKDGKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KEKDGKLV 96
                                                                                                                                                                                                                                                                         in Actinobacillus pleuropneumon
                                                                                                                                                                                                                                                                Acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
8; Conserv
                                                                                                                                                                                                                                                                                                                                                  OM N.A.

74 / SEROTYPE 1;

Ouellet C., J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        81
104
113
113
122
125
160
160
                                                                                                                                                                                                                                                                Res.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pleuropneumoniae
eobacteria; gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    81
114
113
122
125
160
182
130
19718
                                                                                                                                                                                                                                                            lllus pleuropneumoniae.";
20:615-615(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1.3%;
                                                                                                                                                                                                                        ISOLATE 1421 (NIELSEN);
                                                                                                                                                                                                                                     N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MW.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COPPER (BY SIMILARITY).
COPPER AND ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
COPPER (BY SIMILARITY).
BY SIMILARITY.
BY SIMILARITY.
                                                                                                                                                                                                                                                                                                                                                    EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 8; 1
Pred. No.
                                                                                                                                                                                                                                                                                                               1421 (NIELSEN);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           34D702070EE00DDC CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (Haemophilus pleuropneumoniae). subdivision; Pasteurellaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ER (BY SIMILARITY),
ER AND ZINC (BY SIMILARITY).
(BY SIMILARITY).
(BY SIMILARITY).
(BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                Boissinot M.;
                                                                                                                                                                                               Keil
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB
2
                                                        NORMALLY PRODUCED WITHIN
                                                                                                                                                                                               A.D.;
                              = 0(2) + H(2)0(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 186;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                            pathogen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
```

```
RESCULTA
SOCIALIA
SOC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; X99396; CAA67771.1;
EMBL; U51440; AAB02816.1;
EMBL; X63626; CAA45174.1;
EMBL; X83123; CAA58204.1;
PIR; S22161; S22161
PIR; S22815, S22815
PDB; 2APS; 25-FEB-99
                                                                                                                                                                                                                                                                                                                             DISULFID CONFLICT
                            Langford P.R., Kroll J.S.;
Langford P.R., Kroll J.S.;
"Distribution, cloning, characterisation and mutagenesis gene encoding copper/zinc superoxide dismutase, a potenti determinant of virulence, in Haemophilus ducreyi.";
Character Tempunol Med. Microbiol. 17:235-242(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       METAL
METAL
METAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SIGNAL
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     METAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              METAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                METAL
METAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This
                                                                                                                                     MEDLINE=97288949; PubMed=9143881;
                                                                                                                                                           STRAIN=35000;
                                                                                                                                                                                                                NCBI_TaxID=730
                                                                                                                                                                                                                                    Bacteria; Pı
Haemophilus
                                                                                                                                                                                                                                                                                                                Superoxide dismutase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ++
    SEQUENCE
                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                          Haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       InterPro; IPR001424;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   294 KEKDGKLV 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUBCELLULAR LOCATION: Periplasmic.
SIMILARITY: BELONGS TO THE CU-ZN SUPEROXIDE DISMUTASE FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEKDGKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
8; Conser
                                                                                                                                                                                                                                                      Proteobacteria;
                                                                                                                                                                                                                                                                            ducreyi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24
83
85
108
117
117
126
129
164
164
113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ă,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            23
190
83
85
108
117
1126
1129
1164
1186
1113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        136
20207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOD_CU_ZN
                                                                                                                                                                                                                                                                                                              [Cu-Zn] precursor (EC 1.15.1.1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MW;
                                                                                                                                                                                                                                                      gamma subdivision; Pasteurellaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      E -> D (IN REF. 2).
N -> D (IN REF. 2).
FVE -> TIA (IN REF.
W; 5FC1F3148972DC83 C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 8; DB 1; Pred. No. 2.5
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COPPER.
COPPER
ZINC.
ZINC.
ZINC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COPPER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COPPER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SUPEROXIDE DISMUTASE [CU-ZN].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Periplasmic; Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ZINC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .5 <u>1</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3D-structure
                                                                                                of
                                                                                                sodC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
```

÷

```
PUR2_
ID
AC
DT
DT
DT
DT
DE
                                                                                                                                                                                                                                 δÃ
                                                                                           RESULT
                                                                                                                             밁
                                                                                                                                                                       Query Match
Best Local S
Matches 8
                    PUR2_THEMA STAN
Q9X077;
30-MAY-2000 (Rel. 3
30-MAY-2000 (Rel. 3
16-OCT-2001 (Rel. 4
                                                                               THEMA
                                                                                                                                                                                                                               DISULFID SEQUENCE
                                                                                                                                                                                                                                                                           CHAIN
METAL
METAL
METAL
METAL
METAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      use by non-profit institutions as long as its content is in inv mul modified and this statement is not removed. Usage by and for commercial modified and this atlacense agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Prodom; PD000469; PROSITE; PS00087; PROSITE; PS000332;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  entitles requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Stevens M.K., Hassett D.J., Radolf J.D., Hansen E.J.; "Cloning and sequencing of the gene encoding the Cu,Zn-superoxide dismutase of Haemophilus ducreyi."; Gene 183:35-40(1996).
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Phosphoribosylamine--glycine ligase (EC 6.3.4.13) (GARS) (Glycinamide ribonucleotide synthetase) (Phosphoribosylglycinamide synthetase).
                                                                                                                                                                                                                                                               METAL
                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; X98737; CAA67289.1; -.
EMBL; U47664; AAB41293.1; -.
EMBL; X83125; CAA58206.1; -.
HSSP; P24702; 2APS.
                                                                                                                                                                                                                                                                                                                                                SIGNAL
                                                                                                                                                                                                                                                                                                                                                           Oxidoreductase
                                                                                                                                                                                                                                                                                                                                                                                                       Pfam; PF00080; sodcu;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE-96118708;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN-35000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE OF 100-186 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-97149276; PubMed=8996084;
                                                                                                                             102
                                                                                                                                                  294 KEKDGKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUBCELLULAR LOCATION: Periplasmic.
SIMILARITY: BELONGS TO THE CU-ZN SUPEROXIDE DISMUTASE FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 European
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SWISS-PROT entry is copyright. It is produced through een the Swiss Institute of Bioinformatics and the Experimental and the Experimental and the statement of the swiss institute. There are no restrict by non-profit institutions as long as its content
                                                                                                                           KEKDGKLV
                                                                                                                                                                         Similarity
8; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                702; 2APS.
IPR001424; SOD_CU_ZN
                                                                                                                                                                                                                           99
199
                                                                                                                                                                       Conservative (
                                                                                                                             109
                                                                                                                                                  301
                                                                                                                                                                                                                               AA;
                                                                     STANDARD;
                                                                                                                                                                                                                                                                                                                                                          Copper;
                     39,
40,
                                                                                                                                                                                                                                                                                                                                                                     SOD_CU_ZN_1; 1.
SOD_CU_ZN_2; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PubMed=7496539;
                                                                                                                                                                                                                                                                                                                                                                                           SOD_CU_ZN; 1.
                                                                                                                                                                                                                                                     199
199
92
94
117
126
135
138
173
                                                                                                                                                                                                                               195
21402
                                            Created)
                                                                                                                                                                                                                                                                                                                                                          Zinc;
                                                                                                                                                                                                                                 Ŧ
                                                                                                                                                                                                                                               POTENTIAL.

SUPEROXIDE DISMUTASE [CU-ZN].

SUPEROXIDE DISMUTASE [CU-ZN].

COPPER (BY SIMILARITY).

COPPER (BY SIMILARITY).

ZINC (BY SIMILARITY).

ZINC (BY SIMILARITY).

ZINC (BY SIMILARITY).

COPPER (BY SIMILARITY).

COPPER (BY SIMILARITY).
                                                                                                                                                                         0
                                                                                                                                                                                 Score 8; 1
Pred. No.
                                                                                                                                                                                                                                          ВY
                                                                                                                                                                                                                                                                                                                                                        Periplasmic; Signal
                                                                                                                                                                                                                              SIMILARITY.
841D3210AB2BC06C CRC64;
                                                                                                                                                                         Mismatches
                                                                                                                                                                                 DB 1;
                                                                                                                                                                      0;
                                                                                                                                                                                             Length 199
                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ne EMBL outstation restrictions on it
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       þ
                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             collaboration
                                                                                                                                                                      Gaps
                                                                                                                                                                      0
```

```
RESULT 5
                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                 SODC_ACTAL
Q59081:
Q59081:
15-DEC-1998 (Rel. 37, Created)
15-DEC-1998 (Rel. 37, Last sequence update)
15-DEC-1998 (Rel. 41, Last annotation update)
01-MAR-2002 (Rel. 41, Last annotation update)
conneroxide dismutase [Cu-zn] (EC 1.15.1.1) (Fragment).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro; IPR000115; GARS.
Pfam; PF01071; GARS; 2.
Pfam; PF020842; GARS_B; 1.
Pfam; PF02844; GARS_C; 1.
Pfam; PF02844; GARS_N; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Purine bi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-99287316; PubMed-10360571;
Nelson K.E., Clayton R.A., Gill S.R., Gwinn M.L., Dodson R.J.,
Haft D.H., Hickey E.K., Peterson J.D., Nelson W.C., Ketchum K.A.,
HCDONALD L., Utterback T.R., Malek J.A., Linher K.D., Garrett M.M.,
Stewart A.M., Cotton M.D., Pratt M.S., Phillips C.A., Richardson D.,
Heidelberg J., Sutton G.G., Fleischmann R.D., Eisen J.A., White O.,
Salzberg S.L., Smith H.O., Venter J.C., Fraser C.M.;
"Evidence for lateral gene transfer between Archaea and Bacteria from
genome sequence of Thermotoga maritima.";
Nature 399:323-329(1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TIGR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL;
HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     use by non-profit institutions as long as its content modified and this statement is not removed. Usage by an entities requires a license agreement (See http://www.isb-or send an email to license@isb-sib.ch).
MEDLINE-96118708; PubMed=749639;
Kroll J.S., Langford P.R., Wilks K.E., Keil A.D.;
"Bacterial [Cu.Zn]-superoxide dismutase: phylogen
from the eukaryotic enzyme, and not so rare after
                                                                                                                          actinomycetemcomitans)
Bacteria; Proteobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Ex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM
STRAIN=MSB8 /
                                                       STRAIN-Y4
                                                                    SEQUENCE
                                                                                             NCBI_TaxID=714;
                                                                                                           Actinobacillus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=2336;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Thermotogales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Thermotoga maritima
                                                                                                                                                                                                                                                                                                                         351 EKDGKLVT 358
                                                                                                                                                                                                                                                                                                                                                    295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CATALYTIC ACTIVITY: ATP + 5-phosphoribosylamine + phosphate + 5'.phosphoribosylglycinamide. PATHWAY: SECOND STEP IN DE NOVO PURINE BIOSYNTHESI SIMILARITY: BELONGS TO THE GARS FAMILY.
                                                                                                                                                                                                                                                                                                                                                   EKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OR TM1250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TM1250;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AE001780; AAD36325.1;
P15640; IGSO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                     biosynthesis; Ligase;
CE 400 AA; 44326 MW;
                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PS00184; GARS; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IPR000115;
                                                                                                                          Proteobacteria; gamma subdivision; Pasteurellaceae;
                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                    N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3109;
                                                                                                                                                                                                                                                                                                                                                                                            1.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Thermotoga.
                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                          Score 8; Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Complete proteome.
; 411CE014DD7DE90F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PURINE BIOSYNTHESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                             . DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              There are no
phylogenetically
are after all!";
                                                                                                                                                                                                                                                                                                                                                                                             .
6;
                                                                                                                                                                                                                                                                                                                                                                                0,
                                                                                                                                                                                                                                                                                                                                                                                                            Length 400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             glycine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JEMBL
Je her
                distinct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ı
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           outstation
                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              way
                                                                                                                                                                                                                                                                                                                                                                                0
```

```
SO TITIES AND DESCRIPTION OF THE TENT OF T
    δÔ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FUR_SYNP7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FUR_SYNP7
Q55244;
15-DEC-1998
15-DEC-1998
15-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SW1
between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   · the
                                                                                                                                                                            MICROBIOLOGY 142:1469-1476(1996).

-!- FUNCTION: ACTS AS A GLOBAL NEGATIVE CONTROLLING ELEMENT, EMPLOYING FE(2+) AS A COFACTOR TO BIND THE OPERATOR OF THE REPRESSED GENES REGULATES GENES INVOLVED IN IRON SCAVENGING OR PHOTOSYNTHETIC
                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
MEDLINE=96262718; PubMed=8704986;
Ghassemian M., Straus N.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                METAL
METAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; X83122; CAA58203.1; -. HSSP; P24702; 2APS. InterPro; IPR001424; SOD_CU_ZN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the European Bioinformatics Institute. use by non-profit institutions as lowed modified and this statement is not removed.
                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                               "Fur regulates the expression of iron-stress genes cyanobacterium Synechococcus sp. strain PCC 7942.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ProDom; PD000469; SOD_CU_ZN; 1.
PROSITE; PS00087; SOD_CU_ZN_1; PARTIAL.
PROSITE; PS00332; SOD_CU_ZN_2; PARTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=1140
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Cyanobacteria; Chroococcales; Synechococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Synechococcus sp. (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ferric
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               METAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NON_TER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Oxidoreductase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pfam; PF00080;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -i- SUBCELLULAR LOCATION: Periplasmic (By similarity).
-i- SIMILARITY: BELONGS TO THE CU-ZN SUPEROXIDE DISMUTASE FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              294 KEKDGKL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity
les 7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3 KEKDGKL 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TER
                                                                                                               SUBCELLULAR LOCATION: Cytoplasmic (By SIMILARITY: BELONGS TO THE FUR FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                   European
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SWISS-PROT entry is copyright. It is produced through a collaboration reen the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way fied and this statement is not removed. Usage by and for commercial
                                                                                                                                                              ELECTRON TRANSPORT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (Rel. 37, Created)
(Rel. 37, Last sequence update)
(Rel. 37, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                 Swiss Institute
Bioinformatics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18
27
36
39
74
87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ΑĄ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       regulation protein (Ferric uptake regulator).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sodcu;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Copper; Zinc; Periplasmic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18
27
27
36
39
74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ΜW,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PCC 7942) (Anacystis nidulans R2).
                   Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 7;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COPPER AND ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
COPPER (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6704173D25976550 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PARTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB
13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (See http://www.isb-sib.ch/announce/
              There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1;
                                                                                                                                  similarity)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                     in
                   restrictions
                                                                                                                                                                                                                                                                                                        the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                   EMPLOYING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0
```

```
RESULT
YOR2_A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SET WERE DESCRIPTION OF THE PROPERTY OF THE PR
В
                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                        Matches
                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YOR2_AZOVI
069219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           _AZOVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15-JUL-1999 (Rel. 38, Created)
15-JUL-1999 (Rel. 38, Last sequence up
15-JUL-1999 (Rel. 38, Last annotation
Hypothetical 17.8 kDa protein (ORF2).
Azotobacter vinelandii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entitles requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                  EMBL; AF010139; AAC24480.1; -.
Interpro; IRR000944; UPF0074.
Pfam; PF02082; UPF0074; 1.
ProDom; PD003632; UPF0074; 1.
PROSITE; PS01332; UPF0074; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=98250785; PubMed=9582371;
Zheng L., Cash V.L., Flint D.H., Dean D.R.;
These L., Cash V.L., Flint D.H., Dean D.R.;
"Assembly of iron-sulfur clusters. Identification of fdx gene cluster from Azotobacter vinelandii.";
J. Biol. Chem. 273:13264-13272(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       use by non-profit institutions as long modified and this statement is not removed
                                                                                                                                                                                                           Hypothetical protein SEQUENCE 164 AA;
                                                                                                                                                                                                                                                                                                                                                                                          entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                          modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                between the Swiss Institute of Bioinformatics and the the European Bioinformatics Institute. There are no reuse by non-profit institutions as long as its conter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Transcription regulation; Repressor; DNA-binding; DOMAIN 73 76 HIS-RICH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-DJ116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Azotobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ProDom;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam; PF01475; FUR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; L41065; AAB41546.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -!- SIMILARITY: BELONGS TO THE UPF0074 (RFF2) FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              InterPro;
                          324 EVIDAVN 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               285 KIGAKTS
78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 95
EVIDAVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KIGAKTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity 7; Conserv
                                                                                      Similarity 7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            o; IPR002481; FUR.
F01475; FUR; 1.
PD002003; FUR; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             127 AA;
                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14451 MW;
                                                                                                                                                                                                         17831 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1.2%;
                                                                                                                100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gamma subdivision; Pseudomonadaceae;
                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 7;
                                                                                                              Score 7;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HIS-RICH.
; 71586B16BCA69426
                                                                                                                                                                                                           B03C777BF30654CE CRC64;
                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   164
                                                                                                                                                                                                                                                                                                                                                                                                                     (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB
18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (See http://www.isb-sib.ch/announce/
                                                                                                              DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                          Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Usage
                                                                                                                                   Length 164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 127;
                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                          γd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      an iscSUA-hscBA-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                               and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ìs
                                                                                           0,
                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  in
                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                             in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0,
```

RESULT 8

•

```
RESULT 9
SODC_HAEPA
ID SODC_H
C P25842
DT 01-MAY
DT 01-MAY
                                                                                           DЬ
                                                                                                                                 Query Match
Best Local Similarity
Matches 7; Conserv
   01-MAY-1992
01-MAY-1992
01-MAR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-MAY-1992
01-MAY-1992
01-MAR-2002
                                SODC_HAEPA
P25842;
                                                                                                                                                                                  DISULFID
SEQUENCE
                                                                                                                                                                                                                                                                                      Copper;
                                                                                                                                                                                                                         METAL
METAL
METAL
                                                                                                                                                                                                                                                         CHAIN
METAL
SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                              modified and this statement is not removed entitles requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SODC_HAEIN
P25841;
                                                                                                                                                                                                      METAL
                                                                                                                                                                                                                                                                                                        PROSITE; PS00087; SOD_CU_ZN_1; FALSE_NEG PROSITE; PS00332; SOD_CU_ZN_2; 1.
                                                                                                                                                                                                                                                                                                                                       Pfam; PF00080; sodcu;
                                                                                                                                                                                                                                                                                                                                                                                                                             the European Bioinformatics Institute. Thuse by non-profit institutions as long
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               parainfluenzae.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-NCTC 8468 / SEROTYPE B;
MEDLINE-92041655; PubMed-1938942;
Kroll J.S., Langford P.R., Loynds
"Copper-zinc superoxide dismutase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Superoxide
                                                                                                                                                                                                                  METAL
                                                                                                                                                                                                                                                                                                                                                            HSSP; P24702;
                                                                                                                                                                                                                                                                                                                                                                              EMBL; M84012; AAA24953.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=727;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Haemophilus influenzae
                                                                                                                                                                                                                                                                                                                                                InterPro; IPR001424; SOD_CU_ZN
                                                                                                              294 KEKDGKL 300
                                                                                           90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       raintluenzae.;
Bacteriol. 173:7449-7457(1991).
- FUNCTION: THIS PROTEIN LACKS ENZYMATIC ACTIVITY (PROBABLY BECAUSE OF A TYROSINE INSTEAD OF AN HISTIDINE AT RESIDUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SUBCELLULAR LOCATION: Peripi
SIMILARITY: BELONGS TO THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SUBUNIT: HOMODIMER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COFACTOR: Copper and zinc.
                                                                                                                                                                                                                                                                                                                                                                    A41654; A41654.
                                                                                           KEKDGKL 96
                                                                                                                                                                                                                                                                                                                            PD000469; SOD_CU_ZN; 1.
                                                                                                                                                                                                                                                                                                 Zinc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dismutase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (Rel.
(Rel.
(Rel.
   (Rel.
(Rel.
(Rel.
                                                                                                                                                                                                     24
80
82
105
114
123
126
                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                            2APS
                                                                                                                                                                                                                                                                                                Periplasmic;
                                                                                                                                                                                   ΑA;
                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22,
22,
41,
  22,
22,
41,
                                                                                                                                                                                                     187
187
80
82
105
114
123
126
                                                                                                                                                                                   19536
                                                                                                                                           100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     [Cu-Zn] like
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Last sequence update)
Last annotation update)
 Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Created)
                                                                                                                                                                                   MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Periplasmic (Potential).
O THE CU-ZN SUPEROXIDE DISMUTASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gamma
                                                                                                                                                                                                                                                                                               Signal
                                                                                                                                  0,
                                                                                                                                 Score 7; DB 1; Pred. No. 24; 0; Mismatches
                                                                                                                                                                                                    COPPER AND ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
COPPER (BY SIMILARITY).
                                                                                                                                                                                            ВΥ
                                                                                                                                                                                                                                                      SUPEROXIDE DISMUTASE [CU-ZN] LIKE COPPER (BY SIMILARITY).
ANCESTRAL COPPER-BINDING SITE.
                                                                                                                                                                                                                                                                                      POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                  3EE95EFFD52425B3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      subdivision; Pasteurellaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of Haemophilus influenzae and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В.М.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     precursor.
                                          187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       187
                                                                                                                                                                                                                                                                                                                                                                                                          (See http://www.isb-sib.ch/announce/
                                                                                                                                          DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                             There are no rest
                                          ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                                                                    Usage
                                                                                                                                 0
                                                                                                                                                    Length 187
                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                    by and
                                                                                                                                                                                                                                                                                                                                                                                                                                       restrictions
                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                     commercial
                                                                                                                                                                                                                                                                                                                                                                                                                              00
00
                                                                                                                                                                                                                                                                                                                                                                                                                              way
                                                                                                                                0;
                                                                                                                                                                                           YAOD_
ID
AC
DT
DT
DT
                                                                                                   В
                                                                                                                     δÃ
                                                                      RESULT
YAOD_SCHPO
Q10092;
01-FEB-1996 (
01-FEB-1996 (
01-NOV-1997 (
Hypothetical
                                                                                                                                                                                                                                                       METAL
METAL
                                                                                                                                                                                                                                                                           CHAIN
METAL
                                                            SCHPO
                                                                                                                                                                                                                                   METAL
                                                                                                                                                                                                                                             METAL
                                                                                                                                                                                                                                                                                               SIGNAL
                                                                                                   90
```

Ş

chromosome

SOFT TITTER REPRESENTATION OF THE PROPERTY OF

```
Query Match
Best Local S
Matches 7
                                                                                                                                                                                                                                                                                                                                              METAL
METAL
DISULFID
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    J. Bacteriol: 173:7449-7457(1991).

-i- FUNCTION: DESTROYS RADICALS WHICH ARE NORMALLY PRODUCED CELLS AND ARE TOXIC TO BIOLOGICAL SYSTEMS.

-i- FUNCTION: MAY CONFER SURVIVAL ADVANTAGE BY ACCELERATING DISMUTATION OF SUPEROXIDE OF ENVIRONMENTAL ORIGIN TO HYD PEROXIDE, DISRUPTIVE TO THE NORMAL MUCOCILIARY CLEARANCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Prodom; PD000469; SOD_CU_ZN; 1
PROSITE; PS00087; SOD_CU_ZN_1;
PROSITE; PS00332; SOD_CU_ZN_2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Copper-zinc superoxide dismutase parainfluenzae.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=92041655; PubMed=1938942;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Oxidoreductase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pfam; PF00080; sodcu;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PIR; B41654; B41654.
HSSP; P24702; 2APS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; M84013; AAA24954.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Kroll J.S., Langford P.R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Superoxide dismutase [Cu-Zn] precursor (EC 1.15.1.1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             [nterPro;
                                                                                                                                                                                                     294 KEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COFACTOR: Copper and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CATALYTIC ACTIVITY: 2 superoxide + 2 H(+) = O(2) +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SIMILARITY: BELONGS TO THE CU-ZN SUPEROXIDE DISMUTASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SUBCELLULAR LOCATION: Periplasmic (Potential)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUBUNIT: HOMODIMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IN THE HOST
                                                                                                                                                                                  KEKDGKL
                                                                                                                                                                                                                                                  n 1.2%;
Similarity 100.0%
7; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IPR001424; SOD_CU_ZN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Proteobacteria; gamma
                                                                                                                                                                                                                                                                                                                                                24
80
82
105
114
123
126
161
161
187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  parainfluenzae.
(Rel. 33, Created)
(Rel. 35, Last sequence update)
(Rel. 35, Last annotation update)
L 24.2 kDa protein C11D3.13 in chr
                                                                                                                                                                                  96
                                                                                                                                                                                                                                                                                                                                                A,
                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Copper; Zinc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOD_CU_ZN; 1.
                                                                                                                                                                                                                                                                                                                                                                 187
80
82
105
114
113
123
126
183
                                                                                                                                                                                                                                                                                                                                              19510
                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 zinc.
                                                                                                                                                                                                                                                                                                                                                W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Loynds
                                                                                                                                                                                                                                                                                                                                                             ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
ZINC (BY SIMILARITY).
COPPER (BY SIMILARITY).
BY SIMILARITY.
                                                                                                                                                                                                                                                      Score 7; DB 1; Pred. No. 24; 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUPEROXIDE DISMUTASE [CU-ZN].
COPPER (BY SIMILARITY).
COPPER AND ZINC (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Periplasmic; Signal POTENTIAL.
                                                                                            PRT;
                                                                                                                                                                                                                                                                                                                                                A0C3A61EFAF201D5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               subdivision; Pasteurellaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Haemophilus influenzae
                                                                                          222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (See http://www.isb-sib.ch/announce/
                                                                                          ₽
                                                                                                                                                                                                                                                                                         ۲,
                                                                                                                                                                                                                                                                                         Length 187
                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLEARANCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  H(2)O(2).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HYDROGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WITHIN THE
                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ξ
                                                                                                                                                                                                                                                         0;
```

```
SON DEPARTMENT OF SON DEPARTME
RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YM9A_YEAST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NOV-1997 (Rel. 3:
Hypothetical 26 ^
YMR322C ^~
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YM9A_YEAST
Q04902;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EN the European Bioinformatics Institute. There are no restricted the companion of the companion of the control of the companion of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (DEC-1995) to the EMBL/GenBank/DDBJ databases.
-!- SIMILARITY: BELONGS TO THE YMR322C/YOR391C/YPL280W (Y SPAC1F7.06/SPAC5H10.02C/SPAC11D3.13 (S.POMBE FAMILY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-972;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=4896
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Schizosaccharomyces.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Schizosaccharomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Schizosaccharomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SPAC11D3.13.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-S288C / AB972;
Churcher C.M., Louis E.J., Barrell B.G., Rajandream M.A.,
Submitted (NOY-1995) to the EMBL/GenBank/DDBJ databases.
-i-SIMILARITY: BELONGS TO THE YMR322C/YOR391C/YPL280W (Y)
SPAC1F7.06/SPAC5H10.02C/SPAC11D3.13 (S.POMBE FAMILY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Hypothetical protein SEQUENCE 222 AA;
                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Saccharomyces cerevisiae (Baker's yeast).
Eukaryota; Fungi; Ascomycota; Saccharomycetes
                                                                                                                                                                                                                                                            entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                 use by non-profit institutions as long as its content modified and this statement is not removed. Usage by ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Saccharomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hypothetical 26.0 kDa protein YMR322C OR YM9924.14C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; Z68166; CAA92314.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=4932;
                     SEQUENCE
                                                  Hypothetical
                                                                                                                                                                                           EMBL; Z54141; CAA90840.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         197
                                                                                                                          InterPro; IPR002818; ThiJ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | DGKLVTG
                                                                                                                                                       S0004941; YMR322C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DGKLVTG
                                                                                      PF01965; ThiJ; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PF01965; ThiJ; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IPR002818;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Churcher C.M.,
                         237 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ascomycota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   35, Last sequence up 35, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                35, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Saccharomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      pombe (Fission yeast).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        24225 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1.2%;
                            26039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ThiJ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ., Barrell B.G., Rajandream M.A., Walsh S.V.; the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Schizosaccharomycetaceae;
                         MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 7;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Schizosaccharomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9A466BE06AF17AD6 CRC64;
                     004EA3E702332905 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ation update)
FET4-ERR1 intergenic region.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 1
). 28;
                                                                                                                                                                                                                                                                                                    (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    rmatics and the EMBL outst There are no restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Saccharomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rajandream M.A., Walsh
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 222;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (YEAST)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (YEAST),
                                                                                                                                                                                                                                                                                                                                               and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gh a collaboration EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                   no
                                                                                                                                                                                                                                                                                                                                                                                way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
```

```
RESULT
VMTV_LA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                        RESULT 13
밁
                                                                                                                                                                                                        S,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 7
                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21-JUL-1986
21-JUL-1986
01-NOV-1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VMTV_LAMBD P03733;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.

MEDLIND-83189071; PubMed-6221115;

MEDLIND-83189071; PubMed-6221115;

Sanger F., Coulson A.R., Hong G.F., Hill D.F., Petersen Sanger F., Coulson A.R., Hong G.F., Hill D.F., Petersen Sanger F., Coulson A.R., Hong G.F., Hong G.F., Petersen T., Walchedt Biol. 162:729-773(1982).

1. Mol. Biol. 162:729-773(1982).

1. Mol. Biol. 162:729-773(1982).

1. Mol. Biol. 162:729-773(1982).

MOLTION: GENE V PROTEIN IS THE MAJOR COMPONENT OF MAKES UP THE TUBULAR PORTION OF THE TAIL, WHICH IS ABOUT 32 HEXAMERIC DISCS. THERE ARE 135-212 COPIES PROTEIN PER MATURE PHAGE.
                                                 16-OCT-2001 (Rel. 35, Last sequence update)
Putative protein phosphatase (EC 3.1.3.16).
MPN247 OR MP585.
                                                                                         PPH_MYCPN
P75525;
01-NOV-1997
01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Viruses; dsDNA viru
Lambda phage group.
NCBI_TaxID=10710;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LAMBD
                                                                                                                                                                                                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteriophage lambda.
Viruses; dsDNA viruses,
                                                                                                                                                                                                                                                                                                  InterPro; IPR003343; Big_2. Pfam; PF02368; Big_2; 1.
                                                                                                                                                                                                                                                                                                                                                           or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                   use by non-profit institutions as long modified and this statement is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Major tail
                                                                                                                                                                                                                                                                                                                         EMBL; J02459; AAA96545.1; -. PIR; A04359; TLBPVL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         297
                               Mycoplasma pneumoniae Bacteria; Firmicutes;
                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                        entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   212 DGKLVTG 218
                       Mycoplasmataceae;
                                                                                                                                                                                     131
                                                                                                                                                                                                           320 VTAKEVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DGKLVTG 303
                                                                                                                                                                                     VTAKEVI 137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity 7; Conserv
                                                                                                                                                                                                                                  Similarity 7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                           326
                                                                                                                                                                                                                                                                                          Big_2; 1.
AA; 25810 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01,
01,
09,
                                                                                          35,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1.2%;
                                                                                                                                                                                                                                            1.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Last
Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                   Bacillus/Clostridium group; Mollicutes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence up
annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RNA stage; Caudovirales; Siphoviridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                  Score 7; DB 1; Pred. No. 31; 0; Mismatches
                                                                                                                                                                                                                                   0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 7;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                           3E9B2124FF2E80CB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             246 AA
                                                                                                                                259
                                                                                                                                                                                                                                                                                                                                                                        (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 1;
                                                                                                                                                                                                                                              DB 1
                                                                                                                                                                                                                                                                                                                                                                                                as its content
                                                                                                                                                                                                                                                                                                                                                                                      Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                         Length 246
                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Petersen G.
                                                                                                                                                                                                                                                                                            CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               THE TAIL. IT COMPOSED OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OF GENE
                                                                                                                                                                                                                                                                                                                                                                                         and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                         for
                                                                                                                                                                                                                                      0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                    no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                                       0
```

7

```
QУ
Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SO DE RESERVA DE RESER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NPM_MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-NOV-1997 (Rel. 35
01-NOV-1997 (Rel. 35
30-MAY-2000 (Rel. 39
Nucleophosmin (NPM)
                                                                                                                                                                                                                         "DNA cloning and amino acid sequence determination of constituent protein of mammalian nucleoli. Corresponde nucleoplasmin-related protein NO38 to mammalian protei Chromosoma 96:417-426(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q61937;
01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SMART; SM00331; PP2C_SIG; 1.
SMART; SM0332; PP2CC; 1.
Hypothetical protein; Hydrolase; Complete proteome.
DOMAIN 19 259 PP2C-LIKE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              InterPro; IPR001932; PP2C_domain.
InterPro; IPR003643; Putat_PPase.
Pfam; PF00481; PP2C; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A. STRAIN=ATCC 29342 MEDLINE=97105885;
                                                                                                                                                                                                                                                                                                                                                    Schmidt-Zachmann M.S., Franke W.W.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; Metazoa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; AE000057; AAB96233.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    pneumoniae."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Complete sequence analysis of the genome of
                                                                                                                                                                                                                                                                                                                                                                              MEDLINE-89120362;
                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Metazoa; Chordata;
Mammalia; Eutheria; Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mus musculus (Mouse).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-NOV-1997 (Rel. 35, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
Nucleophosmin (NPM) (Nucleolar phosphoprotein
(Nucleolar protein NO38).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NPM_MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -!- CATALYTIC ACTIVITY: A PHOSPHOPROTEIN + H(2)O = A PROTEIN ORTHOPHOSPHATE (THIS ENZYME IS SERINE/THREONINE SPECIFIC)
-!- SIMILARITY: CONTAINS A PP2C-LIKE DOMAIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Nucleic Acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Himmelreich R., Hilbert H., Plagens H., Pirkl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  369 TATVSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  176 TATVSKD
                                                                                                                     FUNCTION: ASSOCIATED WITH NUCLEOLAR RIBONUCLEOPROTEIN STRUCTURES AND BIND SINGLE-STRANDED NUCLEIC ACIDS. IT MAY FUNCTION IN THE ASSEMBLY AND/OR TRANSPORT OF RIBOSOME.

SUBCELLULAR LOCATION: NUCLEAR. GENERALLY NUCLEOLAR, BUT IS TRANSLOCATED TO THE NUCLEOPLASM IN CASE OF SERUM STARVATION OR
                                               SIMILARITY: BELONGS TO THE NUCLEOPLASMIN FAMILY
                                                                                                   TREATMENT WITH ANTICANCER DRUGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity 7; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PD006823; Putat_PPase; 1.
                                                                           PHOSPHORYLATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29342 / M129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    375
                                                                                                                                                                                                                                                                                                                                                                                                        N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AΑ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                 PubMed=3219912;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PubMed=8948633;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24:4420-4449(1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29689 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 7;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Craniata; Vertebrata;
Sciurognathi; Muridae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4EE599CD210A66D8 CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   There are no restrictions ng as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                     Correspondence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Muridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B23) (Numatrin)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ε,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 259
                                                                                                                                                                                                                                                                          protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         bacterium Mycoplasma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           λq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             в.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Murinae; Mus
                                                                                                                                                                                                                                                                                                                          נם
                                                                                                                                                                                                                                                                          major
ice of the
i B23.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              n no way commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
```

This

SWISS-PROT

entry

z

copyright.

Įţ

ŝţ

produced

through

а

collaboration

```
RESULT
NPM_RAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SQ STITE
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
     MOD_RES
                                                                                                                                                                                                                   "Chang J.-H., Dumbar T.S., Olson M.O.J.;
"CDNA and deduced primary structure of rat protein protein containing highly conserved sequences.";
J. Biol. Chem. 263:12824-12827(1988).
                                                                                                                                                                                                                                                                                                                                                              p13084; Q64269; Q63698;

O1-JAN-1990 (Rel. 13, Created)

O1-JAN-1990 (Rel. 13, Last sequence update)

30-MAY-2000 (Rel. 39, Last annotation update)

Nucleophosmin (NPM) (Nucleolar phosphoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Nuclear
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                          SEQUENCE FROM N.A. (B23.2).
MEDLINE=89308567; PubMed=2745414;
Chang J.-H., Olson M.O.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MGD;
                                                                                                          SEQUENCE FROM N.A. MEDLINE=91009311; PubMed=2211699;
                                                                                                                                                      mRNA."
                                                                                                                                                                                                                                                                SEQUENCE FROM N.A., AND PARTIAL S
MEDLINE=88330763; PubMed=3417636;
                                                                                                                                                                                                                                                                                                           Eukaryota; Metazoa; Chordata; Mammalia; Eutheria; Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                               "A single
                                                                                                                                                                                                                                                                                                NCBI_TaxID=10116;
                                                                                                                                                                                                                                                                                                                                Rattus norvegicus (Rat).
                                                                                                                                                                                                                                                                                                                                                                                                                         NPM_RAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pfam; PF03066; Nucleoplasmin;
                                                                                                                                                                                                                                                                                                                                                       Nucleolar protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         462 VSLGAGA 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro; IPR004301; Nucleoplasmin.
                                                                                                                                           . Biol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               47
                                                                                                                                                                                                                                                                                                                                                                                                                                            15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ween the Swiss Institute of Bioinformatics European Bioinformatics Institute. There a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MGI:106184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VSLGAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        M33212; AAA39801.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity 7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein; Phosphorylation;
                                                                                                                                          Chem.
                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
152
158
190
125
185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               53
                                                                                                                                           264:11732-11737(1989)
                                                                                                                                                                 codes for
                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Npml
                                                                                                                                                                                                                                                                                                                                                        NO38).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       132
157
187
196
125
185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1.2%;
100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              32560
                                                                                                                                                                 two forms of rat nucleolar protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MET-RICH.

ASP/GLU-RICH (ACIDIC).

ANUCLEAR LOCALIZATION SIGNAL (POTENTIAL)

ASP/GLU-RICH (HIGHLY ACIDIC).

ASP/GLU-RICH (HIGHLY ACIDIC).

NUCLEAR LOCALIZATION SIGNAL (POTENTIAL)

PHOSPHORVLATION (BY SIMILARITY).

PHOSPHORVLATION (BY SIMILARITY).

PHOSPHORVLATION (BY SIMILARITY).

PHOSPHORVLATION (BY SIMILARITY).

MW; E68750C549ED25E6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 7;
Pred. No.
                                                                                                                                                                                                                                                                                                           Craniata; Vertebrata; Euteleostomi; Sciurognathi; Muridae; Murinae; Rat
                                                                                                                                                                                                                                                                           SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RNA-binding
                                                                                                                                                                                                                                                                                                                                                                                                                         292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB
35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       There are no restrictions
                                                                                                                                                                                                                                                                           (B23.1).
                                                                                                                                                                                                                                                                                                                                                                                                                         Ą
                                                                                                                                                                                                                                                                                                                                                                 B23) (Numatrin)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     and the
                                                                                                                                                                                                                                           B23, a nucleolar
           STARVATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (POTENTIAL).
                                                                  STRUCTURES
                                                      Ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                            Rattus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
           S
R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
```

```
$\frac{1}{2} \frac{1}{2} \frac
Search completed: July 3, 2002, 08:34:30 Job time: 231 sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation—the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                 462 VSLGAGA 468
|||||||
| 47 VSLGAGA 53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PTM: PHOSPHORYLATED.
PTM: THE N-TERMINUS IS BLOCKED.
SIMILARITY: BELONGS TO THE NUCLEOPLASMIN FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ALTERNATIVE PRODUCTS: 2 ISOFORMS; B23.1 (SHOWN HERE) AND B23.2; ARE PRODUCED BY ALTERNATIVE SPLICING.
```

۲,

밁

```
OM protein - protein search, using sw model
                                                        Run on:
                                                     July 3,
                                                                                                                                                                           GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
2002, 08:26:29; Search time 20.95 Seconds (without alignments) 2770.308 Million cell updates/sec
```

Title: Perfect score: Sequence: 604 1 MNXIXRIIWNSALNAWVXVS... US-09-771-382-11 .....TASGNSRGHFGXSASVGYQW

Scoring table: Gapop 60.0 , Gapext 60.0 OLIGO

283138 seqs, 96089334 residues

Word size : 0

Total number of hits satisfying chosen parameters: 283138

Minimum DB seq length: 0
Maximum DB seq length: 200000000

Post-processing: Listing first 45 summaries

Database PIR\_71:\* pir1:\*
pir2:\*
pir3:\*
pir4:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

# SUMMARIES

æ

Result No.	Score	Query Match	Length	DB	ID	Description
1	59	9.8	591	S i	G81133	adhesin NMB0992 [i
ν	59		592	N	w	e surfa
ω		2.0	298	N		Ξ.
4	œ		98	N		de dismu
ъ	œ	1.3	199	N	JC5718	superoxide dismuta
O	œ	1.3	400	N	D72277	phosphoribosylamin
7	00	1.3	438	้ผ	в83295	hypothetical prote
8	8	1.3	498	N	в95998	probable sugar upt
9	8	1.3	574	N	A69196	cell surface glyco
10	8	1.3	1797	N	F69195	cell surface glyco
11	7	1.2	87	N	I39485	superoxide dismuta
12	7	1.2	110	N	AD0902	protein-export mem
13	7	1.2	111	N	AD0425	protein-export mem
14	7	1.2	120	N	B69456	tungsten formylmet
F 5	7	1.2	157	N	A75398	hypothetical prote
16	7	1.2	164	N	T44280	conserved hypothet
17	7	1.2	171	N	AI1962	hypothetical prote
18	. 7	1.2	173	N	C83839	
19	7	1.2	180	N	T34110	$\mathbf{L}$
20	7	1.2	183	N	S73086	
21	7	1.2	187	۳	A41654	superoxide dismuta
22	7	1.2	187	<u>بــ</u>	B41654	superoxide dismuta
23	7	1.2	201	2	A98970	hypothetical prote
24	7	1.2	201	N	G90767	
25	7	1.2	209	N	G85717	probable tail comp
26	7	1.2	220	N	н85742	probable tail comp
27	7	:	222	N	T37522	conserved hypothet
28	7	1.2	237	N	S65313	probable membrane
29	7	1.2	246	<b>j</b>	TLBPVL	major tail protein

4 4 4 5 4 5	410 42	37 38 39	3 3 3 4 5 6	30 32 33
777	1777	777	777	777
1.2	11.2	1.2	1.2	1.2
301 315	292 292 292	259 264 292	253 256 257	246 250 250
221		N <b>N</b> N	N N N	2222
A32915 B35694 T06944	A36089 I52858 JC4741	S73911 D97344 A28939	H83238 B85691 A34168	H90833 A90900 H90997 G85817
nucleopnosmin - nu cut2 protein - fis DNA-directed RNA p	nucleolar phosphop nucleolar protein mosquitocidal toxi	protein phoshatase amino acid (probab nucleophosmin - ra	probable peptidyl- probable tail comp nucleolar phosphop	major tail protein hypothetical prote hypothetical prote hypothetical prote

#### ALIGNMENTS

	*	
A;Accession: GBL133 A;Status: preliminary A;Molecule type: DNA A;Rosidues: 1-591 <tety a;cross-references:="" a;gene:="" b,="" c;genetics:="" gb:ae002098;="" gb:ae002450;="" mc58="" nid:g7226229;="" nmb0992<="" pid:g722="" pidn:aaf41395.1;="" serogroup="" strain="" td=""><td>R; Tettelin, H; Saunders, N.J.; Heidelberg, J; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. ri, H; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M. Science 287, 1809-1815, 2000 A; Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; A; Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58. A; Reference number: A81000; MUID: 20175755</td><td>RESULT 1 G81133 adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B) C;Species: Neisseria meningitidis C;Species: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001 C;Accession: G81133</td></tety>	R; Tettelin, H; Saunders, N.J.; Heidelberg, J; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. ri, H; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M. Science 287, 1809-1815, 2000 A; Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; A; Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58. A; Reference number: A81000; MUID: 20175755	RESULT 1 G81133 adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B) C;Species: Neisseria meningitidis C;Species: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001 C;Accession: G81133

DЬ	Qy	Ма	Ве	ng O
372	384	Matches	st Lo	ery M
372 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 430	384 YDVNYGDALNYNQLQNSGWNLDSKAVAGSSGKVISGNYSPSKGKMDETVNINAGNNIEI 442	ches 59; Conservative 0; Mismatches 0; Indels 0; Gaps	t Local Similarity 100.0%; Pred. No. 1.8e-51;	Query Match 9.8%; Score 59; DB 2; Length 591;
130	142	aps		
		0;		

RESULT 2
A8188
A8188
probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis (strain C;Species: Neisseria meningitidis
C;Species: Neisseria meningitidis
C;Date: 05-May-2000 #sequence\_revision 05-May-2000 #text\_change 02-Feb-2001
C;Accession: A81888
C;Accession: A81888
C;Accession: A61888
C;Accession: A61888

Z

R;Parkhill, J.; Achtman, M.; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, S.R.; Mo; Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quail, M.A.; Rajandre Nature 404, 502-506, 2000
A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis Z2491
A;Reference number: A81775; MUID:20222556
A;Accession: A81888
A;Status: preliminary

A;Cross-references: GB:AL162755; GB:AL157959; NID:g7379742; PIDN:CAB84461.1; PID:g737 A;Experimental source: serogroup A, strain Z2491 C;Genetics: A; Molecule type: DNA A; Residues: 1-592 < PAR>

A; Gene: NMA1200

```
C;Genetics:
A;Gene: sodC
C;Function:
A;Description: catalyzes the dismutation of 2 molecules of peroxide rad:
C;Superfamily: superoxide dismutase (Cu-Zn)
C;Superfamily: superoxide dismutase (Zu-Zn)
C;Keywords: copper; metalloprotein; oxidoreductase; zinc
F;18,27,36,39/Binding site: zinc (His, His, His, Asp) #status predicted
F;91/Active site: Arg #status predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C; Species: Actinobacillus pleuropneumoniae C; Date: 16-Aug-1996 #sequence_revision 05-Mar-1999 #text_change 20 C; Accession: 139650; S22815; S22161 R; Kroll, J.S.; Langford, P.R.; Wilks, K.E.; Keil, A.D. Microbiology 141, 2271-2279, 1995 A; Fitle: Bacterial [Cu.zn]-superoxide dismutase: Phylogenetically A; Feference number: 139485; MUID:96118708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               adhesin homolog HI1732 - Haemophilus influenzae (strain Rd KW20)
C;Species: Haemophilus influenzae
C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 24-Oct-1997
C;Accession: I64138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage, Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weldman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M. Science 269, 496-512, 1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                       A;Cross-references: EMBL:X63626; NID:g38951; PIDN:CAA45174.1; PID:g1333704 A;Note: this sequence was submitted to the EMBL Data Library, December 1991 A;Note: neither the complete nucleic acid sequence nor the complete translation
                                                                                                                                                                                                                                                                             A; Molecule type: DNA
A; Residues: 88-98 <LOY>
                                                                                                                                                                                                                                                                                                                                 Nucleic Acids Res. 20, 615, 1992
A;Title: recf in Actinobacillus pleuropneumoniae.
A;Reference number: S22813; MUID:92158680
A;Accession: S22815
                                                                                                                                                                                                                                                                                                                                                                                                                                A;Cross-references: EMBL:x83123; NID:g1019747; PIDN:CAA58204.1; R;Loynds, B.M.; Langford, P.R.; Kroll, J.S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Status: preliminary; translated A;Molecule type: DNA A;Residues: 1-87 <KRO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   superoxide dismutase (EC 1.15.1.1) (Cu-Zn) - Actinobacillus pleuropneumoniae (fragments C; Species: Actinobacillus pleuropneumoniae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Molecule type: DNA
A; Residues: 1-298 <TIGR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae A;Reference number: A64000; MUID:95350630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Accession: I39650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Cross-references: GB:U32846; GB:L42023; NID:g1574588; PID:g1574589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: I64138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Status: nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  200 KDVLNAGWNIKG 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       226 KDVLNAGWNIKG 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity hes 12; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9.8%;
100.0%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 12;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 2; L.
3. 1.8e-51;
0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2; 1
. 0.00071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 298;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                       peroxide radical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20-Jun-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PID: g1019748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           distinct from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      influenzae Rd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TIGR:HI1732
                                                                                                          б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                       dioxygen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the
                                                                                                                                                                                                            are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Venter,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              euk
                                                                                                                                                                                                            shov
```

A,

Conservative

0;

Mismatches

0,

Indels

0,

Gaps

0

```
C;Genetics:
A;Gene: sodC
C;Function:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C;Species: Haemophilus ducreyi
C;Date: 09-Dec-1997 #sequence_revision 09-Dec-1997
C;Accession: JC5718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             F;1-22/Domain: signal sequence #status predicted <SIG> F;23-199/Product: superoxide dismutase (Cu-2n) #status predicted F;92,94,117,173/Binding site: copper (His) #status predicted F;99-195/Disulfide bonds: #status predicted F;192/Active site: Arg #status predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gene 183, 35-40, 1996
A;Title: Cloning and sequencing of the gene encoding the Cu,Zn-superoxide dismutase
A;Reference number: JC5718; MUID:97149276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         R;Stevens, M.K.; Hasse
Gene 183, 35-40, 1996
                                                                                                                                                                                                                                                                      A;Title: Evidence for lateral gene transfer between Archaea A;Reference number: A72200; MUID:99287316 A;Accession: D72277
                                                                                                                                                                                                                                                                                                                                                                                                                                phosphoribosylamine--glycine ligase - Thermotoga maritima (strain MSB8)
C;Species: Thermotoga maritima
C;Date: 11-Jun-1999 #sequence_revision 11-Jun-1999 #text_change 21-Ju1-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C; Superfamily: superoxide dismutase (Cu-Zn) C; Keywords: copper; metalloprotein; oxidoreductase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type: DNA
A; Residues: 1-199 <STE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                       A;Gene: TMI250
C;Superfamily: phosphoribosylamine--glycine ligase; phosphoribosylamine--glycine
                                                                                                                                                                                                                                                                                                                                                                         R;Nelson, K.E.; Clayton, R.A.; Gill, S.R.; Gwinn, M.L.; Dodson, R.J.; Haft, D.H.; Higarrett, M.M.; Stewart, A.M.; Cotton, M.D.; Pratt, M.S.; Phillips, C.A.; Richardson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Description: catalyzes the dismutation of 2 molecules of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Cross-references: GB:U47664; NID:g1305411; PIDN:AAB41293.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                superoxide dismutase (EC 1.15.1.1) (Cu-Zn) precursor - Haemophilus ducreyi
                                                                                                                                                                A; Experimental source:
                                                                                                                                                                                          A;Cross-references: GB:AE001780;
                                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 1-400 <ARN>
                                                                                                                                                                                                                                                   A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                   Nature 399, 323-329, 1999
                                                                                                                                                                                                                                                                                                                                                                                                                 C; Accession: D72277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Accession: JC5718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local
Best Local Similarity
Matches 8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                102 KEKDGKLV 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      294 KEKDGKLV 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          294 KEKDGKLV 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                                              TM1250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KEKDGKLV 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1.3%;
ilarity 100.0%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hassett, D.J.; Radolf, J.D.; Hansen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                  :AE001780; GB:AE000512; NID:g4981796; PIDN:AAD36325.1; PID:g498 strain MSB8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 100.0%;
                         100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 8;
Pred. No
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
                       Score 8; I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 8;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏ.
            DB
11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .
9 ?
                                            ږ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                            Length 400;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      E.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             peroxide radical to dioxyg
                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PID:g1305412
                                                                                                                                                                                                                                                                                                                    Bacteria from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
```

```
R;Finan, T.M.; Weidner, S.; Wong, K.; Buhrmester, J.; Chain, P.; Vorholter, F.J.; Proc. Natl. Acad. Sci. U.S.A. 98, 9889-9894, 2001
A;Title: The complete sequence of the 1,683-kb pSymB megaplasmid from the N2-fixir A;Reference number: A95842; MUID:21396508; PMID:11481431
A;Accession: B95998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               probable sugar uptake ABC transporter ATP-binding protein SMb21422 [imported] C;Species: Sinorhizobium meliloti
C;Species: Sinorhizobium meliloti
C;Date: 24-Aug-2001 #sequence_revision 24-Aug-2001 #text_change 30-Sep-2001
C;Accession: B95998
R;Finan, T.M.; Weidner, S.; Wong, K.; Buhrmester, J.; Chain, P.; Vorholter, F.
                                                                                                                                                                                                                                                                                                                                            A;Cross-references: GB:AL591985; PIDN:CAC49650.1; PID:g15141137; GSPDB:GN00167 A:Experimental source: strain 1021, megaplasmid pSymB R;Galibert, F.; Finan, T.M.; Long, S.R.; Pühler, A.; Abola, P.; Ampe, F.; Barlopela, D.; Chain, P.; Cowie, A.; Davis, R.W.; Dreano, S.; Federspiel, N.A.; Fisi L.; Hyman, R.W.; Jones, T. Science 293, 668-672, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Status: preliminary
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1-438 <STO>
A;Cross-references: GB:AE004707; GB:AE004091; NID:g9948876; PIDN:AAG06182.1; GSPDB:GN001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Accession: B83295
R;Stover, C.K.; Pham, X.Q.;
adman, S.; Yuan, Y.; Brody,
                                        δÃ
                                                                                                                                                                                C;Genetics:
A;Gene: SMb21422
A;Genome: plasmid
                                                                                                                                                                                                                                                              A;Authors: Kahn, D.; Kahn, M.L.; Kalman, S.; Keating, D.H.; Kiss, E.; Komp, C.; L hebault, P.; Vandenbol, M.; Vorholter, F.J.; Weidner, S.; Wells, D.H.; Wong, K.; A;Title: The composite genome of the legume symbiont Sinorhizobium meliloti. A;Reference number: A96039; MUID:21368234; PMID:11474104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Title: Complete genome sequence of Pseudomonas A; Reference number: A82950; MUID:20437337 A; Accession: B83295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .; Lory, S.; Olson, M.V. Nature 406, 959-964, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hypothetical protein PA2794 [imported] - Pseudomonas aeruginosa (strain PAO1) C;Species: Pseudomonas aeruginosa C;Date: 15-Sep-2000 #sequence_revision 15-Sep-2000 #text_change 31-Dec-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
      д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Residues: 1-498 < KUR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Gene: PA2794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Experimental source: strain PAO1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                              A; Contents: annotation
                                                                                    Query Match
Best Local S
Matches 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             407 KAVAGSSG
                                            468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       274 KAVAGSSG 281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    295
                                                                                  Local Similarity
hes 8; Conserv
      90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
nes 8; Conserv
      ADAPTLSV
                                            ADAPTLSV 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EKDGKLVT
                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1.3%;
                                                                                                  1.3%; Score 8;
100.0%; Pred. No
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Erwin, A.L.; Mizoguchi, L.L.; Coulter, S.N.; Fo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                    0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 8; 1
                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                       No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
                                                                                                       DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               hi, S.D.;
Folger, F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aeruginosa PA01,
                                                                                0;
                                                                                                                        Length 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; Warrener,
K.R.; Kas,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     from the N2-fixing end
                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  an opportunistic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽°:,
                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Hickey,
Larbig,
                                                                                                                                                                                                                                                                                                                                                                                         Barloy-Hubler; Fisher, R.F.
                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0,
                                                                                                                                                                                                                                                                                                        Lelaure, ; Yeh, K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               M.J.; Br
K.; Lim,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sinorhi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Herna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    path
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT
F69195
                                                                                                                        RESULT
                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
Microbiology 141,
```

```
A; Experimental s
C; Genetics:
A; Gene: MTH716
                        superoxide dismutase (EC 1.15.1.1) (Cu-Zn) - Actinobacillus actinomycetemcomitans C;Species: Actinobacillus actinomycetemcomitans C;Date: 19-Jul-1996 #sequence_revision 19-Jul-1996 #text_change 18-Jun-1999 C;Accession: 139485 R;Kroll, J.S.; Langford, P.R.; Wilks, K.E.; Keil, A.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ki, S.; Church, G.M.; Daniels, c.u., ......
J. Bacteriol. 179, 7135-7155, 1997
J. Bacteriol. 179, 7135-7155, 1997
A;Title: Complete genome sequence of Methanobacterium thermoautotrophicum Delta H: A:Reference number: A69000; MUID:98037514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R;Smith, D.R.; Doucette-Stamm, L.A.; Deloughery, C.; Lee, H.; Dubois, J.; Aldredge, Qiu, D.; Spadafora, R.; Vicaire, R.; Wang, Y.; Wierzbowski, J.; Gibson, R.; Jiwan, ki, S.; Church, G.M.; Daniels, C.J.; Mao, J.; Rice, P.; Noelling, J.; Reeve, J.N. J. Bacteriol. 179, 7135-7155, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cell surface glycoprotein (s-layer protein) - Methanobacterium thermoautotrophicum C;Species: Methanobacterium thermoautotrophicum C;Date: 05-Dec-1997 #sequence_revision 05-Dec-1997 #text_change 05-Dec-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
"hes 8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cell surface glycoprotein (s-layer protein) - Methanobacterium thermoautotrophicum
C;Species: Methanobacterium thermoautotrophicum
C;Date: 05-Dec-1997 #sequence_revision 05-Dec-1997 #text_change 22-Oct-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C;Accession: A69196
R;Smith, D.R.; Douce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Status: preliminary; nucleic acid sequence not shown; translation A;Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Title: Complete genome sequence of Methanobacterium thermoautotrophicum Delta A; Reference number: A69000; MUID:98037514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C; Accession: F69195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Start codon:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Gene: MTH719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Cross-references: GB:AE000851; GB:AE000666; NID:g2621803; PIDN:AAB85224.1; PID:g262
A;Experimental source: strain Delta H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Cross-references: GB: AE000666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Residues:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Accession: F69195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Experimental source: strain Delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Residues: 1-574 <MTH>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Status: preliminary; nucleic acid sequence not shown; translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ;Smith, D.R.; Doucette-Stamm, L.A.; Deloughery, C.; Lee, H.; Dubois, J.; Aldredge, T. Qiu, D.; Spadafora, R.; Vicaire, R.; Wang, Y.; Wierzbowski, J.; Gibson, R.; Jiwani, i, S.; Church, G.M.; Daniels, C.J.; Mao, J.; Rice, P.; Noelling, J.; Reeve, J.N. Bacteriol. 179, 7135-7155, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                              1705
                                                                                                                                                                                                                                                                                                               431 TVNINAGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         431 TVNINAGN 438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           482 TVNINAGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1-1797
                                                                                                                                                                                                                                                                                                                                                               Similarity
8; Conserv
Langford, P.R.; Wilks,
11, 2271–2279, 1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source: strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1.3%; Score 8; ilarity 100.0%; Pred. No Conservative 0; Mismai
                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                 1712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      <HTH>
                                                                                                                                                                                                                                                                                                                                                                                       1.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Delta
                                                                                                                                                                                                                                                                                                                                                                  0,
                                                                                                                                                                                                                                                                                                                                                                                       Score 8;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            red. No. 15
Mismatches
                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                          DB 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB
                                                                                                                                                                                                                                                                                                                                                                                                                  2;
                                                                                                                                                                                                                                                                                                                                                                                                               Length 1797;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 574;
                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              not
                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Jiwani,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           fu
```

```
A;Gene: sodC
C;Function:
A;Description: catalyzes the dismutation of 2 molecules
C;Superfamily: superoxide dismutase (Cu-Zn)
C;Keywords: copper; metalloprotein; oxidoreductase; zinc
F;18,27,36,39/Binding site: zinc (His, His, His, Asp) #s
                                  A;Title: Genome sequence of Yersinia pestis, the causative agent of plague A;Reference number: AB0001; MUID:21470413; PMID:11586360 A;Accession: AD0425
                                                                                                 R;Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, deno-Traga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, I.M.; Rtherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barr, Nature 413, 523-527, 2001
                                                                                                                                                                                 protein-export membrane protein [imported] - Yersinia pestis (strain CO92)
C;Speckes: Yersinia pestis
C;Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 09-Nov-2001
C;Accession: AD0425
                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Gene: secG
C;Superfamily: protein-export protein secG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Authors: Parry, C.; Quail, M.; Rutherford, K. A; Title: Complete genome sequence of a multiple A; Reference number: AB0502; PMID:11677608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C;Species: Salmonella enterica subsp. enterica serovar Typhi A;Note: this species has also been called Salmonella typhi C;Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change 27-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Cross-references: EMBL:X83122; NID:g1019745; PIDN:CAA58203.1; PID:g1019746 C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: DNA
A; Residues: 1-87 < RES>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Title: Bacterial [Cu,Zn]-superoxide dismutase: Phylogenetically distinct from A;Reference number: I39485; MUID:96118708
A;Accession: I39485
                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Cross-references: GB:AL513382; PIDN:CAD07810.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Reference number: AB0502; A; Accession: AD0902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R; Parkhill, J.; Dougan, G.; James, th, T.; Connerton, P.; Cronin, A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
A; Molecule type:
                                                                                                                                                                                                                                                                                          RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Residues: 1-110 <PAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Nature 413, 848-852, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein-export membrane protein {imported} - Salmonella enterica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AD0902
                   Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S.; Moule, S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Accession: AD0902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Status: preliminary; translated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          294 KEKDGKL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
hes
                                                                                                                                                                                                                                                                                                                                                      56 TAVLATL
                                                                                                                                                                                                                                                                                                                                                                                             36 TAVLATL 42
                                                                                                                                                                                                                                                                                            13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3 KEKDGKL 9
                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity 7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                O'Gaora, P.
                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                      62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 7;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 K.D.; Thomson, N.R.; Pickard, I
Davis, P.; Davies, R.M.; Dowd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB . 30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 2;
). 37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .
:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 drug
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Simmonds, M.; drug resistant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Asp) #status
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PID:g16504358; GSPDB:GN00176
                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      peroxide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Skelton, J.;
Salmonella e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   D.; Wain, J.; Churcher, L.; White, N.; Farrar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           subsp.
                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    radical to dioxygen
                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             enterica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   enterica
                                                                                                                       Prentice, M.B. Dougan, G.; S.; Barrell,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Stevens,
                                                                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the euk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             serova
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sero
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ~
```

Ç

Conservative

0,

Mismatches

0,

Indels

0;

Gaps

0

ŏ.

100.0%;

```
A; Status : I DNA
A; Molecule type: DNA
A; Residues: 1-157 < WHI>
A; Cross references: GB: AE001986;
A; Cross references: Strain R1
                                                                                                                                                                                                                                                                                                                                                                      C;Accession: A75398
R;White, O.; Eisen, J.A.; Heidelberg, J.F.; Hickey, E.K.; Peterson, J.D.; Dodson, M. Shan. M.: Vamathevan, J.J.; Lam, P.; McDonald, L.; Utterback, T.; Zalewski,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Authors: Utterback, T.; Cotton, M.D.; Spriggs, T.; Artiach, P.; Kaine, B.P.; Sykes, Smith, H.O.; Woese, C.R.; Venter, J.C.
A;Title: The complete genome sequence of the hyperthermophilic, sulfate-reducing arch A;Reference number: A69250; MUID:98049343
A;Accession: B69456
Query Match
Best Local Similarity
Thes 7; Conserve
                                                                                                                                                                                                                                                                                A; Title: Genome sequence of the radioresistant bacterium Deinococcus radiodurans A; Reference number: A75250; MUID:20036896 A; Accession: A75398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R;Klenk, H.P.; Clayton, R.A.; Tomb, J.F.; White, O.; Nelson, K.E.; Ketchum, K.A.; D.; Fleischmann, R.D.; Quackenbush, J.; Lee, N.H.; Sutton, G.G.; Gill, S.; Kirkness, Glodek, A.; Zhou, L.; Overbeek, R.; Gocayne, J.D.; Weidman, J.F.; McDonald, L. Nature 390, 364-370, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tungsten formylmethanofuran dehydrogenase, subunit D (fwdD-1) homolog - Archaeoglobus
C;Species: Archaeoglobus fulgidus
C;Date: 05-Dec-1997 #sequence_revision 05-Dec-1997 #text_change 21-Jul-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Gene: secG
C; Superfamily: protein-export protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Residues: 1-111 <KUR>
A;Cross-references: GB:AL590842; PIDN:CAC92728.1; PID:g15981423; GSPDB:GN00175
                                                                                                                       A; Map position:
                                                                                                                                                                                                                                                                                                                                         S.; Smith, H.O.; Venter, J.C.; Fraser, C.M.
Science 286, 1571-1577, 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Date: 03-Dec-1999 #sequence_revision 03-Dec-1999 #text_change 17-Mar-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: GB:AE000989;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: DNA
A; Residues: 1-120 <KLE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: preliminary; nucleic acid sequence not shown; translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C; Accession: B69456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C; Genetics:
                                                                                                                                                                                                                                                             A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                hypothetical protein - Deinococcus C; Species: Deinococcus radiodurans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A75398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B69456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT
                                                                                                                                                           Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              500 GVKEGDV 506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          36 TAVLATL 42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
nes 7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        46 GVKEGDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity les 7; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     56 TAVLATL 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14
                                                                                                                                          DR1406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein - Deinococcus radiodurans (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            100.08; Pr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 7; DB 2
; Pred. No. 37;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GB:AE000782; NID:g2689312;
                                     Score 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0,
                                                                                                                                                                                                     GB:AE000513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 7;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 2;
o. 39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB
37;
                             DB 50;
                                                                                                                                                                                                     NID:g6459162;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2
                                                          ν,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 111;
                                                            Length 157;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                     PIDN:AAF10987.1; PID:g645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PIDN:AAB89592.1; PID:g264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sulfate-reducing arch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                          <u>R</u>1
                                                                                                                                                                                                                                                                                                                                                                                   R.J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                bod
s, E
```

ОУ

501 VKEGDVT 507 ||||||| 51 VKEGDVT 57

Search completed: July 3, 2002, 08:31:01 Job time: 272 sec

\$1. \$1 THIS PAGE BLANK (USPTO)

PI XXX PI

```
DAX ACCUMENTATION OF A CONTRACT OF A CONTRAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAU06183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively inmunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen Nhha deletion mutant #1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Claim 12; Fig 5; 91pp; English.
WPI; 2001-488774/53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis strain H41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         mutant;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N. meningitidis H41 NhhA deletion mutant.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAU06183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                     UQYU)
                                                                                                                                                                                                     25-JAN-2000;
                                                                                                                                                                                                                                                                          25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                  WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Peak IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
||||||||||||||||||||
293 ydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmdetvninagnniei 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2001-488774/53.
                                                                                                                                 ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         mutein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAS09172.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       standard;
                                                                Jennings MP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              512 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9.8%;
ilarity 100.0%;
Conservative (
                                                                                                                                                                                                     2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NhhA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label= Signal_peptide 52..513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningococcal

    mature_NhhA_deletion_mutant
        "Predicted mature protein, specifically
        claimed in claim 12"

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     disease; meningitis vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.5e-49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 512;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
```

밁 γ

```
RESULT
AAY23745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         THE TENT OF THE TE
₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local S
Matches 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antiqen Nhha (AAU06182-AAU06186). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectivel immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain H41 surface antigen NhhA deletion mutant.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY23745 standard; Protein; 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        preventing broad spectrum of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             New NhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N-PSDB; AAS09173
                                                                                                                             Claim 1;
                                                                                                                                                                                   meningitidis infections
                                                                                                                                                                                                                                                                  WPI; 1999-418754/35.
N-PSDB; AAX85797.
                                                                                                                                                                                                                                                                                                                                            Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY23745
                                                                                                                                                                                                                                                                                                                                                                                                  (ISIS-) ISIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                             Page 122-124; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Fig
                                                                                                                                                                                                            meningitidis surface proteins useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         513 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9.8%;
ilarity 100.0%;
Conservative (
                                                                                                                                                                                                                                                                                                                                                                                                     INNOVATION QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6; 91pp;
                                                                                                                                                                                                                                                                                                                                                  Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                peptide.
                                                                                                                                                                                                                                                                                                                                                  ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 %; Score 59; DB
%; Pred. No. 1.5
0; Mismatches
                                                                                                                               English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 22; I
. 1.5e-49;
ches 0;
                                                                                                                                                                                                               for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 513;
                                                                                                                                                                                                               z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       or
```

0;

meningitidis which is approximately which is approximately surface glycoproteins, nucleic acids, the prisurface glycoproteins, or antibodies are

The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally surface glycoproteins, nucleic acids, the primers and optionally

```
AAU06173
ID AAUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                  333333×3
В
                                                                                                                                                                                                                                                                                                                                                                                                   δã
                                                                                                                                                                                                                                                                                                                                                                   RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                             the detection or diagnosis of N. meningitidis infection in hur The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especial in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
       Peak IRA,
                                 25-JAN-2000; 2000US-0177917
                                              25-JAN-2001;
                                                           02-AUG-2001
                                                                         WO200155182-A1
                                                                                                                                                              Region
                                                                                                                                                                                  Region
                                                                                                                                                                                                     Region
                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                  Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                              N. meningitidis P20 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                            24-OCT-2001
                                                                                                                                                                                                                                                                                                                                         AAU06173;
                                                                                                                                                                                                                                                                                                                                                      AAU06173
                  (UYQU ) UNIV QUEENSLAND
                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                                                                                                                                                                                                                                                                   ٥
                                                                                                                                                                                                                                                                                                                                                                                                                  59.
                                                                                                                                                                                                                                                                                                                                                      standard;
                                                                                                                                                                                                                                                                                     meningitidis strain
       Jennings MP
                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                            (first entry)
                                              2001WO-AU00069
                                                                                    /label= V4
/note= "Variable region 4
234..589
/label= C5
/note= "Conserved region
                                                                                                                                          /label= V3
/note= "Variable region 3"
206..224
                                                                                                                                                                                                     /note= "Conserved
118..121
                                                                                                                                                                                                                                              /note= "Conserved region
51..105
                                                                                                                       225..233
                                                                                                                                                             /note= "Conserved
186..205
                                                                                                                                                                                                                        /note= "Variable region 1"
                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                       /label= V2
/note= "Variable region
                                                                                                                                                                                                                                                          /label= C1
                                                                                                                              note= "Conserved"
                                                                                                                                                                                                                                      /label= V1
                                                                                                                                     'label=
                                                                                                                                                                           'label=
                                                                                                                                                                                                                   'label=
                                                                                                                                                                                                                                                                                                                                                      Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                      9.8%;
                                                                                                                                                                                  . 185
                                                                                                                                                                                                                                                                                                                                                      589
                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                       Score 59;
Pred. No.
                                                                                                                                                                                                                                                                                     P20.
                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                     region
                                                                                                                            region
                                                                                                                                                                                                           region
                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                      DB 20; I
1.7e-49;
                                                                                                                                                                                        2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        infection in humans.
                                                                                                                                                                                                                                                                                                                                                                                                                             Length 589;
                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           especially
                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                 0
                                                                                                                                                                                                                                      RESULT :
Ş
                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                           Matches
                                                                                     09-OCT-1998;
14-JAN-1998;
01-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 2001-488774/53.
N-PSDB; AASO9163.
                                        N-PSDB;
                                                           Grandi G,
                                                                                                                                                                                                     24-SEP-1999
                                                                                                                                                                                                                   AAY27202;
                                                                                                                                                                                                                                                                                                                            Sequence
                                                                        (CHIR-) CHIRON SPA.
                                                                                                               14-JAN-1999;
                                                                                                                             22-JUL-1999.
                                                                                                                                                                                        Amino acid
                                       1999-444400/37.
DB; AAX99124.
                                                          Masignani
                                                                                                                                                                                                                                                                                                                           589 AA;
```

```
characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding the wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain P20 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modified or mutant when the characterists
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 9; Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        preventing broad spectrum of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating
the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 or
```

```
384 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 442
369 ydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmdetvninagnniei
                                                    Conservative
                                                              9.8%;
                                                   0;
                                                                Score 59;
Pred. No.
                                                    Mismatches
                                                                DB 22; 1
. 1.7e-49;
                                                                           Length 589
                                                    Indels
                                                   Gaps
  427
                                                    0;
```

```
AAY27202 standard; Protein;
sequence of N. meningitidis protein ORF40-1.
                                           (first entry)
                                                                                                                                  591 AA
```

bacterial infection; treatment. Neisseria meningitidis protein; pharmaceutical; vaccine; diagnosis;

Neisseria meningitidis

99WO-IB00103

98GB-0022143. 98GB-0000760. 98GB-0019015.

< Pizza ĭ Rappuoli R, Scarlato

New protein and its nucleotide sequence, useful in vaccines or diagnostic compositions for treating and/or preventing Neisser meningitidis infections

Claim 1; Page 62; 123pp; English

```
Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Post-processing: Minimum Match 08
Maximum Match 1008
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Total number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             on
     Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3003
2464.5
                                                                          609
371.5
378.3
371.5
363.3
363.3
363.2
244.5
239.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
232.5
23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               length:
length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        hits satisfying chosen
                                                                                                                                                                                                                                                                                      100.0
82.1
20.3
13.6
12.4
12.1
12.1
12.1
11.0
8.0
7.7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PIR_71:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-771-382-1
3003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           July
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           283138 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVVVS...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           pir1:*
pir2:*
pir3:*
pir4:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2000000000
   298
2059
1107
1190
1588
1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2002, 08:04:58; Search time 95.27 Seconds (without alignments) 596.083 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GenCore version 4.5 (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             96089334 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapext 0.5
                                                                                                               H83135
AI0452
T31102
                                                                                                                                                                                                                                               A43855
C48399
B43855
AF0394
S28634
                                                                                                                                                                                                                                                                                                                                                                                                                                     G81133
A81888
I64138
D82671
AC0976
A82615
                                                            T09083
                                                                                                                                                                    D90803
H85611
F90696
T31105
                                                                                                                                                                                                                                                                                                                                           C82672
G64964
                     A35140
B85547
                                                                                                 A56143
                                                                                                                                                                                                                                                                                                                                                                                                                       A86036
                                                                                                                                                                                                                                                                                                                                                                                                  н91188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ltd
                                                                                                                                                                                                                         ABC-type transport high-molecular-wei probable adhesin hadhesin hadhesin AIDA-I pre AidA-I adhesin-lik
hemagglutinin/hemo
sapB protein - Cam
hemolysin A precur
probable RTX famil
ydeK protein - Esc
                                                                                                                                                                                                                                                                                                                                                                            surface protein XF
probable adhesin Z
probable adhesin E
probable surface p
                                                                                                                                                                                                                                                                                                                                                                                                                                                    adhesin homolog HI
surface protein XF
probable autotrans
                                                                                                                                                 hypothetical prote
probable adhesin P
                                                                                                                                                                                                                                                                                                                     hypothetical prote
high-molecular-wei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Description
                                                                                              surface-array prot
                                                                                                             filamentous hemagg
                                                                                                                                                                                        hypothetical prote
                                                                                                                                                                                                           probable adhesin Z
                                                                                                                                                                                                                                                                                                                                                            surface-exposed ou
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 probable surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   adhesin NMB0992 [i
                                                                                                                                   nemolysin
                                                                                                                                   [importe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             591
```

A;Cross-references: GB:AE002450; GB:AE002098; N:A;Experimental source: serogroup B, strain MC58 C;Genetics:
A;Gene: NMB0992

NID: 97226229; PIDN: AAF41395.1; PID: 9722

A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.;
A;Title: Complete genome sequence of Neisseria meningitidis serogroup B
A;Reference number: A81000; MUID:20175755
A;Accession: G81133
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-591 <TEP>
A;Residues: 1-591 <TEP>

autotransporter pr	AD3203	Ν	1035	6.3	190.5	45
190K surface antig	A41477	N	2249	6.4	191	44
hemolysin A - Serr	A28182	2	1608	6.4	191.5	43
probable autotrans	AF0351	N	1430	6.4	192	42
hypothetical prote	AH2515	N	4936	6.4	193.5	41
probable invasin Y	AB0480	N	3013	6.4	193.5	40
hypothetical prote	E90893	N	1343	6.4	193.5	39
hypothetical prote	S76109	N	3029	6.5	194.5	38
hypothetical prote	AC2224	Ŋ	1428	6.5	194.5	37
hypothetical prote	A85547	N	1461	6.5	195	36
hypothetical prote	AG2560	N	1487	6.5	196.5	35
hypothetical prote	D85724	N	1343	6.5	196.5	34
hypothetical prote	F85809	N	585	6.6	197	ω ω
flagellin [importe	F90961	2	585	6.6	197	32
probable autotrans	AD0123	N	3705	6.6	198	31
hypothetical prote	E90696	N	1461	6.6	199	30

#### ALIGNMENTS

adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup C;Species: Neisseria meningitidis C;Date: 31-Mar-2000 #sequence\_revision 31-Mar-2000 #text\_change 19-Jan-2001 C;Accession: G81133 C;Accession: G81133 C;Accession: G81133 C;Bettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.

R:Tettelin, H.; Saunders, N.J.; Heldelberg, J.; Jeffries, A.C.; Nelson, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; ri, H.; Oin, H.; Vamatheyan, J.; Gilli, J.; Scarlato, V.; Masignani, V.; Science 287, 1809-1815, 2000

K.E.; Eisen, Dougherty, B. Pizza, M.

Rappuoli, R.; strain MC58.

Q Qy Ş 밁 Q 밁 QΥ 밁 QY ₽ B В Š Matches 591; Query Match
Best Local Similarity 181 361 301 301 181 121 121 241 61 19 1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN 180 VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV TDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNYTFASGKGTTATV TDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV **VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS** MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 100.0%; ilarity 100.0%; Conservative 0. 0; Score 3003; DB 2 Pred. No. 7e-141; Mismatches 2; 0: Length Indels 591; 0; Gaps 420 240 120 120 360 300 300 240 60 60 360 0

```
probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001 C;Accession: A81888 R.Parkhill, J.; Achtman, M.; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quail, M.A.; Nature 404, 502-506, 2000 A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigiti A;Reference number: A81775; MUID:20222556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A:Status: preliminary
A:Molecule type: DNA
A:Molecule type: DNA
A:Residues: 1-592 <PAR>
A:Residues: 1-592 <PAR>
A:Cross-references: GB:AL162755; GB:AL157959; NID:g7379742; PIDN:CAB84461.1; PID:g737989
A:Experimental source: serogroup A, strain Z2491
C:Genetics:
C:Genetics:
A:Gene: NMA1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
A81888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                           망
                                                                                                                                                     Qy
                                                                                                                                                                                             В
                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                            Б
                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
Ъ
                       QΥ
                                                              В
                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                             114
                                                                                                                                                                                               232
                                                                                                                                                                                                                                                                                              174
 412
                                                                                              352
                                                                                                                                                               292
                                                                352
                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NINAGNNIEITRNGKNIDIATSMTPQFSSYSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                             DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                              QNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNG
                                                                                                                                            KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA 351
                                                                                                                                                                                                 TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                              DTTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                              Q-----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                          YLDPVQRTVAVLIVNSDKEGTGEKEKVE-ENSDWAVYFNEKGVLTAREITLKAGDNLKIK 119
               SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNV 470
                                                                               SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP 411
                                                                                                                               KGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA
                                                                                                                                                                                                                                                                                                                                                                                             -LESVQRSV-VGSIQASMEGSGELETISLSMTNDSKEFVDPYIV----VTLKAGDNLKIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEE-
 SKGKMDETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              506;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          82.1%;
84.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 2464.5;
Pred. No. 2.4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .4e-114;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A strain of Neisseria menigitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         M.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      480
                                                                                                                                                                                                                                                                                                                              173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                              173
                                                                                                                                                                                                                                                                                                                                                                                               113
                                                                                                                                                                                                                                                                                                233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Klee,
                                                                                                                                  351
                                                                                                                                                                                                 291
                                                                                                                                                                                                                                 291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S.R.; Morel
Rajandream,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Z2491.
```

```
adhesin homolog H11732 - Haemophilus influenzae (strain Rd KW20)
C;Species: Haemophilus influenzae
C;Accession: 164138
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.;
Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.;
Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.,
D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geophage
Science 269, 496-512, 1995
Science 269, 496-512, 1995
Science 269, 496-512, 1995
Science 269, 496-512, 1995
Science 369, 496-512, 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Molecule type: DNA
A;Residues: 1-298 <TIGR>
A;Cross-references: GB:U32846; GB:L42023; NID:g1574588;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                 Qy
                                                                                                           밁
                                                                                                                                                             Š
                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Status: nucleic acid sequence not shown; translation
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               532
  276
                                                                                                                                                                  232
                                                                                                                                                                                                                          157
                                                                                                                                                                                                                                                                                                                                     100
                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                    50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         . W 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSKDANKPYRITNVAPGYKEGDYTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGI
                                                                                                           KQLKDANTGTATNATE
                                                                                                                                                                                                                                                       NGDTTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG
                                                                                                                                                                                                                                                                                                                                     DQGGKSVTFALAKDLDVKTAKVSDTLTIGGNTPAAGGATPKVSITSTADGLKLAK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIK-
                                                       KD--KGENGSSTDEGE
                                                                                                                                                                                                                          NGDTAVHLNGLASTLPDVTTNTGASTSVT-FSPSDIEKTRAATIKDVLNAGWNIKGAKVA
                                                                                                                                                                                                                                                                                                                                                                                       -QNGTNFTYSLKKDLTDLTSVGTEKLSFSAN-----GNKVNITSDTKGLNFAKETAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                    -INDAGTFVKVQSTEDDIEDSAATK--DDNKNQALKAGD-----TLTLKAGKNLKAKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              146;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20.3%; Score 609; DB 2;
46.2%; Pred. No. 2.7e-23;
tive 42; Mismatches 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 298;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PID:g1574589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kirkness, E.F.; Kerlavage
A.; Kelley, J.M.; Weidman
n, J.L.; Geoghagen, N.S.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               influenzae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TIGR: HI1732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   531
                                                                                                                                                                           291
                                                                                                                                                                                                                                  215
                                                                                                                                                                                                                                                                                       231
                                                                                                                                                                                                                                                                                                                                                                                                     171
                                                                                                                                                                                                                                                                                                                                                                                                                                                         99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                       275
                                                                                                                                                                                                                                                                                                                                              156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         H.O.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  R
```

RESULT 4

182671

Surface protein XF1529 [imported] - Xylella fastidiosa (strain 9a5c)

Surface protein XF1529 [imported] - Xylella fastidiosa (strain 9a5c)

C;Species: Xylella fastidiosa
C;Species: Xylella fastidiosa
C;Species: Nylella fastidiosa
C;Species: Nylella fastidiosa
C;Accession: D82671

C;Accession: D82671

A;Title: The genome sequence of the plant pathogen A;Reference number: A82515; MUID:20365717 A;Note: for a complete list of authors see reference

reference

number

R; anonymous, The Xylella fastidiosa Consortium Nature 406, 151-157, 2000

of

Organization

for

Nucleotide

Xylella

fastidiosa A59328 below

```
J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigu chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, E.A;Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F. M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.P. Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A.;Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A.P.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; A.; Roference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Accession: D82671
A;Status: preliminary
A;Molecule type: DNA
A;Rolecuse: 1-2059 <SIM>
A;Rolecuse: 1-2059 <SIM>
A;Rolecuse: 1-2059 <SIM>
A;Rosiduses: 1-2059 <SIM>
A;Cross-references: GB:AE003982; GB:AE003849; NID:g9106554; PIDN:AAF84338.1; GSPDB:A;Cross-references: Strain 9a5c
R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carras-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.;
J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.;
                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Contents: annotation C; Genetics:
                                                                                                                                                                                             õ
                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
Ş
                                                  밁
                                                                                           Ş
                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 173; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1679
                                                                                                                                                                                                                                                                                                                                                                                                                                              1739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1444
                                                                                                                                                  1916
                                                                                                                                                                                                                                                  1859
     540
                                                                                                  484
                                                                                                                                                                                                  424
                                                                                                                                                                                                                                                                                                   392
                                                                                                                                                                                                                                                                                                                                                                                                359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KNTDGNLTISKSGDSNDVVFNLSEDLKEKSITVGNTQLDKDGVKVSSNVLLDSNELVITS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VVINNGGKISGVTAGTEETD--AVNFSQLKSISTAVDQGWTLTASGANGSKVASGGTVDL 1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LIVNSDKEGTGEKEKVEENSDWAVYFNE-KGVLTARE----ITLKAGDNLKIKQNGT---
                                                                                                                                                                                                                                                TDDMRHEINNIEDVFKITKGDSASSVKGMGVNAMAIGTNAAVSGTESVALGK---NTNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                           TGSKAIAAGVGTQASGEGAAAVGSGAAASGKGSTAIGRNAIASADGSVALGDGAKDGGRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGQ---ADKFETVTSGTNV----TFASGKGTTA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SGFNAGDKVISHVAVGMADTDAVNVSQLKQAVQSVTVKATRYYSTNDGGTQGGNYDGDGA 1738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TGKDKGEN-----GSSTDEGEGLVTAKEVIDAVNKAGWRMKTTT-----ANGQ 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TNVTAGTEDTDAVNFSQLK---SVSEAVDKGWTLTASGANGSKVVSGGTVDLKNTDGNLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TNVT-----KGVKPGTTASDNVD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HSSTSSVKTLANGESVVNRTVVNGDGVNIDDVVVVNDLGLSIVGGASLTLSGINAGSHKI 1563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DT-----GSTLTDTLLNTGA--T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----NFTYSLKKDLTDL-----
     MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                     VAAGTADTDAVNVSQLNQGLITAKQYTDGMVGNLRRETSGGVAAAIATANLPQAYVQGRG
                                                                                                VAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNAR----AGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITN
                                                                                                                                                                                                                                                                                                                                              AESYTGKYSGVQNNTVGTVSVGDAAKGETRSISNVADAKEAMDAVNLRQLDAVAQKSNLQ 1858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ISKSGDSNDVVFNLSKDFKVDEVTAGNTVVNTDGVKVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---FVRTYDTVEFLSADTK----TTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13.1%;
24.3%;
                                                                                                                                                                                                                                                                                                                                                                                           TVS-----KDDQGNITVMYDVNVG-DALNVNQL----QNSGWN
                                                                                                                                                  -SVADRANSVSVGSG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 393; DB 2;
Pred. No. 1.4e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                           KAVAGSSGKVISGNVSPSKGKMDETVNIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -TSVGTEKLSFSAN----GNKVNITS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  216;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --SDVSLGAMGLFIANGPSVTA
                                                                                                                                                  -----GSER-----QVTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 2059;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                  539
                                                                                                                                                                                                                                           1915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1503
                                                                                                                                                  1947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1678
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  157
                                                                                                                                                                                                                                                                                                                                                                                              391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSPDB:GN00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            R.;
```

```
В
2008
2059
```

G

Se

```
probable autotransporter sapB [imported] - Salmonella enterica subsp. enterica C;Species: Salmonella enterica subsp. enterica serovar Typhi A;Note: this species has also been called Salmonella typhi C;Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change 09-Nov-2001 C;Accession: ACO976
R;Parkhill, J.; Dougan, G.; James, K.D.; Thomson, N.R.; Pickard, D.; Wain, J.; th, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           , S.; Moule, S.; O'Gaora, P.
Nature 413, 848-552, 2001
A;Authors: Parry, C.; Quail, M.; Rutherford, K.; Simmonds, M.; Skelton, J.;
A;Title: Complete genome sequence of a multiple drug resistant Salmonella en
A;Reference number: AB0502; PMID:11677608
A;Accession: AC0976
                                                                        ğ
                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type: DNA
A; Residues: 1-1107 <PAR>
A; Cross-references: GB:Al
C; Genetics:
                                      B
                                                                                                              Ъ
                                                                                                                                              γ
                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Status: preliminary
  438
                                                                                                                                                    364
                                                                                                                                                                                          677
                                                                                                                                                                                                                                326
                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                564
                                                                                                                                                                                                                                                                                                                                                                                                                          504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      273
                                      797
                                                                                                                737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                YITENGTGVKYIRTNDNGLEGQ------DAYATGNGATAVGYDAVASGAGCLALGQNSS
                                                                                                                                                                                                                                                                                                                                                                    TVN-----VESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK------GENGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DI---AANTTNITQNSTAIENLNTSVSDINTSITGLTDNALLWDEDTGAFSANHGGSTSK 446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TFSASRNGSASKITNLAAGTLAADSTDAVNGSQLYETNQKVD--QNTSAIADINTSITNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TKRASATVKTAVLATLLFATVQASANNEEQEEDLY-----LDPVQRTVAVLIVN-----
                                    SVGEFSVGSEDGQRQITNVAAGSADTDA---VNVGQLKVTDAQVSRNTQSITNLNTQVSN 853
                                                                                                                DAGIGIGINTLYMADAINGIAIGSNARANHANSIAMGNGSQTTRGAQTDYTAYNMDTPQN
                                                                                                                                                    DQG----NITVMYDVNVGDALNVN-
                                                                                                                                                                                          TNVADGSEAQDAVTVRQLQNAIGAVTTTPTKYYHANSTEEDSLAVGTDSLAMGAKTIVNA
                                                                                                                                                                                                                                TTTANGQTGQ-
                                                                                                                                                                                                                                                                    SSIEGSIALGSGSTSNRAITTGIRETSATSDGVVIGYNTTDRELLGALSLGTDGESYRQI
                                                                                                                                                                                                                                                                                                            STDEG --
                                                                                                                                                                                                                                                                                                                                                                                                                          GAFSASHGTSGTNKITNVAAGEIASDSTDAINGSQLYETNMLISQYNESISQLAGDTSET
                                                                                                                                                                                                                                                                                                                                                                                                                                                              RAASVKDVLNAGWNIKGVKPGTTASDNVDFV---RTYDT-----VEFLSADTKTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ITNVAAGALSEDSTDAVNGSQLYETNQKVDQNTSAIAD--INT-SITNLGTDALSWDDEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ITSDTKGLNFAKETAGTNG----DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKK 210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EITLKAGDNLKIKQNGT---NFTYSLKKDLTDLTSVGTEKL----SFSAN--GNKVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SSDNLSWNETTNSFSASHGSSTTNKITNVAAGELSEESTD-AVNGSQLFETNEKVDQNTT 389
                                                                          AVAGSSGKVISGNVSPSKGKMDETVNINAG----NNIEITRNGKNI--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GB:AL513382; PIDN:CAD03303.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SDKEGTGEKEKV-----EENSDWAV----YFNEKGVLTAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                          ---EGLV----TAKEVIDAVNKA----GWRMK
                                                                                                                                                                                                                              -ADKFETVTSGTNVTFASGKGTTA----TVSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   378;
No. 3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
1.5e-11;
-SSVSLGAGADAP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  250;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PID:g16504923;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 1107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                    QLQNSGWNLDSK - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                312;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSPDB:GN00176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Wain, J.; Church; White, N.; Farr
                                                                                                                  796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                257
    459
                                                                                                                                                      395
                                                                                                                                                                                                                                363
                                                                                                                                                                                                                                                                        676
                                                                                                                                                                                                                                                                                                          325
                                                                                                                                                                                                                                                                                                                                                616
                                                                                                                                                                                                                                                                                                                                                                                      299
                                                                                                                                                                                                                                                                                                                                                                                                                            563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            75
                                                                            437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     enterica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Stevens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 serova
```

```
R:Simpson, A.J.G.; Reinach, F.C.; Alrruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; Abriones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, Hashunge, E. Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S. submitted to GenBank, June 2000

A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frohn J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigr Chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, F.A., Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.R. Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silveir M.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; A; Reference number: A59328
                                                                                                                                             20
                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                              2
                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   surface protein XF1981 [imported] - Xylella fastidiosa (strain 9a5c)
C;Species: Xylella fastidiosa
C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             γ
                                                Qy
                                                                                                 Вb
                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Contents: annotation C;Genetics: A;Gene: XF1981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Residues: 1-1190 <SIM>
A; Residues: 1-1190 <SIM>
A; Cross-references: GB:AE004017; GB:AE003849; NID:g9107083; PIDN:AAF84783.1;
A; Experimental source: strain 9a5c
A; Experimental source: strain 9a5c
A; Experimental source: strain 9a5c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Title: The genome sequence of the plant pathogen Xylella fastidiosa. A;Reference number: A82515; MUID:20365717
A;Note: for a complete list of authors see reference number A59328 below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           R, anonymous, \ \mbox{The Xylella fastidiosa Consortium of the Organization for Nucleotide Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ъ
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C; Accession: A82615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Accession: A82615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1092
                                                                                                                                                                                                                                                                                                       557
723 WNLLASGANSSNVAPGESVDLKNTDGNIVISKESGSNDVLFNLSSSLKLDKLTVGDTVMT
                                                                                                                                                                                                                                                 72 LIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREIT------LKAGDNLKIKQN 121
                                                                                                                                                                                                                                                                                                                                                17 VVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDLYLDPVQRT-----VAV 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          σ
                                                                                                                                             GTNFTYSLKKDLTDLTSVGTEKLSFSANGNKV-NI---TSDTKGLNFA
                                                                                                                                                                                                DLKNSD--GNLLITKTTDSND--VTFNLATALKVDSLTTGNTAMTTDGVTVGSNVTLGST 672
                                                                                                                                                                                                                                                                                                  VTSSGISAGNQKITNVAAGTADTDAVNFSQLQAVSSTASKGWNLLASGANSSNVVPGESV 616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NSQGDYSAAIGAGFQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NSRGHFGASASVGYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KMSGGIASAMAMAGLPQAYAPGANMTSIAGGTFNGESAVAIGVSMVSESGGWVYKLQGTS 1091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SVLNLGDGSGGTTRIGNVSAAVNDTDAVNYAQLKRSVEEANTYTDQKMGEMNSKIKGIEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SVADEANTVSVGSSTQQR---RITNVAAGVNNTDAVNVAQLKASEAGSVRYETNADGSVNY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LDTRVTNIENGIGDIVTTGSTKYFKTNTDGADANAQGADSVAIGSGSIAAAENSVALGTN
                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA
                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                 -DGPSVTSSG----ISAGNQKITNVAAGTADTDAVNFSQLQAVSSTASKG
                                                                                                                                                                                                                                                                                                                                                                                                                             12.4%; 23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1107
                                                     KETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 371.5; DB Pred. No. 8e-11;
                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20-Aug-2000 #text_change 20-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1190;
                                                TNGDTTVH 178
                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               971
  782
                                                                                                                                               165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              515
                                                                                                                                                                                                                                                                                                                                                                                                   28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSPDB:GN00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Seque
                                                                                                                   δÃ
                                                                                                                                                                      рЬ
                                                                                                                                                                                                                     QУ
                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
A86036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2
                                                                                                                                                                                                                                                                           1022
                         263
                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                      121 NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVN-ITSDTKGLNFAKETAGTNGDTTVHL 179
```

7

SKDNGK----KTEVKIGAKTSVIKEK--

KKRAASVKD-

LLGALSIGDDGKYRQIIN------VADGSEAHDAVT-VRQLQNAIGAVATTPTKYFHAN 1193

DGKLVTGKDKGE - - - -

-----VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVE 262

NSVAKGDSSVAIGQGSYSDVDTGIALGSSSVSSRVIAKGSRDTSITENGVVIGYDTTDGE

1141

NATIMMIEQNTQIINQLAGNTDATYIQENGAGINYVRTNDDGLAFNDASAQGVGATAIGY 1081

---GSTLTDTLLNTGA-TTNVTNDNV-----TDDE 208

78; Mismatches

Indels

Gaps

```
A; Experimental source: strain C; Genetics:
                                                                                                                                                                                                                                                                                 A;Title: Genome sequence of enterohemorrhagic Escherichia A;Reference number: A85480; MUID:21074935; PMID:11206551 A;Accession: A86036
                                                                                                                                                                                                                                                                                                                                                                                                                              A;Cross-references: GB:AE005174; NID:g12518349; PIDN:AAG58749.1; GSPDB:GN00145; A;Experimental source: strain O157:H7, substrain EDL933
                                                                                                                                                                                                                A; Molecule type: DNA
A; Residues: 1-1588 <STO>
                                                                                                                                                                                                                                                             A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                             iller, L.; Grotbeck, E.J. Nature 409, 529-533, 2001
                                                                                                                                                                                                                                                                                                                                                                                 R;Perna, N.T.; Plunkett III, G.; Burland, V.; Mau, B.; Glasner, J.D.; Rose, iller, L.; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis,
Best Local Similarity 24.7 Matches 145; Conservative
                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1140 TSVGVSSYRGQSAIAVGVSSVSESGRWVFKFSGSANTRSQVGIGAGVGYQW 1190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAGTADTDAVNVSQLNQGLITAKQYTDGVVGSLRRDTDGGVAAAIATANLPQAYIPGRGM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNAR----AGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VDATAIGVGATASGADSIAMGNKASASADNAVAIGNHSVADRANTVSVGSAGSERQVTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADAPTLSV-----DGDALNVGSK----KDNKPV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QNNTVGTVSVGDASKGETRTVS----NVADAKEAT--DAVNLRQLDRVAQDANRYVDNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----EGATAVGSGAAASGKGSTAIGRNAVASADGSVALGD-GAKDGARGAESYTGKYSGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VNLSQLNTAMAGSGAKSVHYYSTYD--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TNGV-----TVGSGVTLGSMGLVITDGPSVTSSGI----NAGSQKITNVAAGTADTDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG-WNIKGVKPGTTASD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IESLSEGQTF-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQL----QNSGWNLDSK 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IKEKDGKLYTGKDKGENG-SSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSV
                      12.1%; Score 363; DB 2 24.7%; Pred. No. 3e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----SATP-----IAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----GGTQGGNYNGDGATGTRSIAVGVGTLASA
                                             DB 2;
                                          Length 1588;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----RITNV
                                                                                                                                                                                                                                                                                                                                      coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1079
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      993
                                                                                                                                                                                                                                                                                                                                                                                    D.J.;
K.; A
  22
                                                                                                                                                                                                                                                                                                                                                                                    .; May
Apoda
```

EDL93

```
A; Molecule type: DNA
A; Residues: 1-1588 <HAY>
A; Residues: 1-1588 sides: 1-1588 side
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         probable adhesin ECs4480 [similarity] - Escherichia coli (strain ol C;Species: Escherichia coli
C;Species: Escherichia coli
C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 02-
C;Accession: H91188
R;Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yo
gasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shi
DNA Res. 8, 11-22, 2001
A;Title: Complete genome sequence of enterohemorrhagic Escherichia
A;Reference number: A99629; MUID:21156231; PMID:11258796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Reference number: A99629;
A; Accession: H91188
A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
Ş
                                                           밁
                                                                                                                          20
                                                                                                                                                                                            В
                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                       1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1254
                                                                                                                                                                                                   1194
                                                                                                                                                                                                                                                                                                                          1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1194
                                                                  1254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 349
   349
                                                                                                                                                                                                                                                              263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121 NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVN-ITSDTKGLNFAKETAGTNGDTTVHL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
nes 145; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIG
                                                              GNGSTTTRGAQTNYTAYNMDAPQNSVGEFSVGSADGQRQITNVAAGSAD----TDAVNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DASAQGKDSVATGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRITNVAAGKNATD
   TFASGKGTTATVSKDDQGNITVM----
                                                                                                                                                                                         STEEDSLAVGTDSLAMGAKTIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAI 1253
                                                                                                                                                                                                                                                                                                                      LLGALSIGDDGKYRQIIN-----VADGSEAHDAVT-VRQLQNAIGAVATTPTKYFHAN 1193
                                                                                                                                                                                                                                                                                                                                                                                                                                                    NSVAKGDSSVAIGQGSYSDVDTGIALGSSSVSSRVIAKGSRDTSITENGVVIGYDTTDGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NATINAMIEQNTQIINQLAGNTDATYIQENGAGINYVRTNDDGLAFNDASAQGVGATAIGY 1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGTYNGESAVALGVSMVSANGRWVYKLQGSTNSQGEYSAALGAGIQW 1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VAQLKGVAQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AVNVAQLKSSEAGGVRYDTKADG---SIDYSNITLGG-GNGGTTRISNVSAGVNNNDVVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -IDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QNSGWNLDSKAVAGSSGKVISGNVSPSKGKM---DETVNINAGNNIEITRN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GNGSTTTRGAQTNYTAYNMDAPQNSVGEFSVGSADGQRQITNVAAGSAD----TDAVNV
                                                                                                                                                                                                                                                       SKDNGK----KTEVKIGAKTSVIKEK------DGKLVTGKDKGE-------
                                                                                                                                                                                                                                                                                                                                                                                  KKRAASVKD-----VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STEEDSLAVGTDSLAMGAKTIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSTAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --GQLKVTDAQVSQNTQ-SITNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGV 1365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TFASGKGTTATVSKDDQGNITVM-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTNV
                                                                                                                          NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12.1%;
24.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --NLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 363;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ed. No. 3e-10;
Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18-Jul-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----YDVNVGDAL-----
   -YDVNVGDAL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 2; Length 1588;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            228;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; Yokoyama, K.;
Shinagawa, H.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                O157:H7, substrain
   NVNQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NVNOL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             coli 0157:H7
                                                              1308
                                                                                                                                                                                                                                                                                                                                                                                                                                                 1141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           348
                                                                                                                             348
                                                                                                                                                                                                                                                                                                                                                                                     262
                                                                                                                                                                                                                                                           296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Han,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RIMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ġ
```

```
C;Accession: AH0110
C;Accession: AH0110
R;Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, R;Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, R;Parkhill, J.; Whitehead, S.; Barr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           probable surface protein (partial) YPO0902 [imported] - Yersinia pestis (st C;Species: Yersinia pestis
C;Species: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
AH0110
                                  Ω
                                                                            В
                                                                                                                                                    В
                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type: DNA
A; Residues: 1-658 <KUR>
A; Cross-references: GB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Title: Genome sequence of Yersinia pestis, the causative agent of A;Reference number: AB0001; MUID:21470413; PMID:11386360 A;Accession: AH0110 A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Doil, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Nature 413, 523-527, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
밁
                                                                                                            οy
                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Gene: YP00902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 132; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  437
498
                                      450
                                                                            443
                                                                                                                393
                                                                                                                                                        406
                                                                                                                                                                                          333
                                                                                                                                                                                                                                365
                                                                                                                                                                                                                                                                      273
                                                                                                                                                                                                                                                                                                            318
                                                                                                                                                                                                                                                                                                                                                219
                                                                                                                                                                                                                                                                                                                                                                                      274
                                                                                                                                                                                                                                                                                                                                                                                                                            161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    101 GVLTAREITLKAGDNLKIKONGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTK 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ဖ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              GAVTSQANSIALG-AASINTYGAQSSYSAYALTAPQASYGELGIG-TALGNR-KITGVAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VAQLKGVAQ-----NLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --GQLKVTDAQVSQNTQ-SITNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGV 1365
TAFGSGAKATAANSAALGANSVADRANSVSVGSVGNER---QITNVAPATQGTDAVNFDQL
                                      VSLGAGADAP---
                                                                                                                                                                                                                                AIG--DGAAASADGSVAIGQGSGDNGRGVENYIG------KYSNASNTS
                                                                                                                                                                                                                                                                    KIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ
                                                                                                                                                                                                                                                                                                            ANGG-GVKYFHANSTQPDSV--
                                                                                                                                                                                                                                                                                                                                              LNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT-----EV
                                                                                                                                                                                                                                                                                                                                                                                    G-----SASSDAVNVAQLTAVGDQVQQN-----TANITSLGGRVTTIE----GSMASI
                                                                                                                                                                                                                                                                                                                                                                                                                        GLNFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTN--DNVTDDEKKRAASVKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GGTYNGESAVALGVSMVSANGRWVYKLQGSTNSQGEYSAALGAGIQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AVNVAQLKSSEAGGVRYDTKADG----SIDYSNITLGG-GNGGTTRISNVSAGVNNNDVVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -IDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTN 495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QNSGWNLDSKAVAGSSGKVISGNVSPSKGKM----DETVNINAGNNIEITRN----GKN---
                                                                            ----IAASIVVVENNVSGLQNGTDGMFQVNNSSGLAKPSATGANSATGGAGSVASGNNS
                                                                                                              DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EITRNGKNIDI--ATSMTPQFSS
                                                                                                                                                    SG-----LQATDAVNLRQLDG-----
                                                                                                                                                                                        TGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DASAQGKDSVAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRITNVAAGKNATD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GB:AL590842;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11.0%;
25.2%;
                                    TLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQL 499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 331.5; DB 2; Pred. No. 3.5e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PIDN:CAC89747.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches 204;
                                                                                                                                                                                                                                                                                                            -ASGTNSVAIGPASLASGNAALASGAGAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PID:g15978974;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels 113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   658;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     pestis (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSPDB:GN00175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 plague
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1425
                                                                                                                  449
                                                                                                                                                      442
                                                                                                                                                                                                                                405
                                                                                                                                                                                                                                                                      332
                                                                                                                                                                                                                                                                                                            364
                                                                                                                                                                                                                                                                                                                                                                                      317
                                                                                                                                                                                                                                                                                                                                                                                                                            218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        544
555
                                                                            497
                                                                                                                                                                                            392
                                                                                                                                                                                                                                                                                                                                                  272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tice, M
ugan, G
Barrel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C092)
```

```
A; Experimental source: strain 9a5c

A; Experimental source: strain 9a5c

R; Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; A Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H Briones, Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H Briones, E. Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.

submitted to GenBank, June 2000

A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frohm J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigu Chado, M.A.; Madeira, A.M.B. M. Marino, C.L.; Marques, M.V.; Martins, H.A.; Marino, C.L.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.R. Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A; Authors: da Silva, A.J., da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silveir M.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; A.Reference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Contents: annotation C; Genetics:
                                                                                                                                             Qy
                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                 Ър
                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: DNA
A; Residues: 1-1004 <SIM>
A; Cross-references: GB: AEO03981; GB: AE003849;
A; Cross-references: GB: AEO03981; GB: AEO03849;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                surface-exposed outer membrane protein XF1516 [imported] - Xylella fastidiosa C;Species: Xylella fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                            δÃ
                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Title: The genome sequence of the plant A; Reference number: A82515; MUID:20365717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         R; anonymous, The Xylella fastidiosa Consortium of the Organization Nature 406, 151-157, 2000\,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Note: for a complete list of authors see reference number A59328 below A; Accession: C82672
7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ;Species: xylella fastidiosa;Date: 18-Aug-2000 #sequence_revision
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                           117
                                                    294
                                                                                                                                                                                                                                                                                                                    171
                                                                                                                                                                                                                                                                                                                                                                      154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KGVAQN----LNNRIDNVDGNAR------AGIAQAIATAGLVQAYLPGKSMMAIGGGTY
                                                                                                    SALGFDSHAKGINSTTVGTQSVSLG-QGGVSLGYNSFVGEGSFNGLALGSNSLVLLQGVD
                                                                                                                                                        --LSADT----
                                                                                                                                                                                                          SVKTIALTNQVTGSSVASASGKESTAIGSGAQAVADN-----
                                                                                                                                                                                                                                                                                                              NVISVGGG-----DGVTGPAVRRIVNVG----DGIGNNDAVNKSQLDGVTASVNDVAA
                                                                                                                                                                                                                                                                                                                                                                NITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAA 213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --YFNEKGVLTAREITLKAGDNLKIKONGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKV 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----SPAMVTASKVMVAHVDSQVNRTADRIPTGDGSELMTHMALDWKFFPFGNNSIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QEEDLYLDPVQRTVA-VLIVNSDKE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NKTYRTIWNSALNAWVVVSELTRNH-----TKRASATVKTAVLATLLFATVQASANNEE 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KSISNQTNAYTNQRYSELKQDLRKQNSVLSAGIASAMSMASLTQPYTSGSSMTTIGAASY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NQIYRKFWNLSLGSWSVASHMINDGGCSDVVLRHSGVRNRSLVLAIGLALISVTHAQSVK 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                      -KTTTVNVESKDNGKKTEVKIGAKTSV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8.1%;
                                                                                                                                                                                                                                                            ---NAGWNIKGVKPGTTA-SDNVDFVRTYDTVEF------
                                                                                                                                                                                                                                                                                                                                                                                                                           - IALGYNSSVTQSANN-GVALGSNST-VSGVNSVALGAGSMASEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 244.5; Ub 2,
pred. No. 0.00012;
pred. No. 277;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20-Aug-2000 #text_change 20-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----GTGEKEKVEENSDWAV------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             pathogen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NID:g9106543;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                xylella
                                                                                                                                                   ----IKEKDGKLVTGKD
                                                                                                                                                                                                          -TVAFGGRAIANAVGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1004;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 193;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fastidiosa.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIDN: AAF84325.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                          271
                                                                                                                                                                                                                                                                                                                                                                                                                           170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSPDB:GN00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequer
```

```
664964
hypothetical protein b2000 - Escherichia coli
C;Species: Escherichia coli
C;Date: 12-Sep-1997 #sequence_revision 17-Sep-1997 #text_change 02-Feb-2001
C;Accession: 664964
C;Accession: 664964
C;Accession: 664964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Cross-references: GB:AE000291; GB:U00096; NID:g1788298; A;Experimental source: strain K-12, substrain MG1655 C;Keywords: nucleotide binding; P-loop F;683-690/Region: nucleotide-binding motif A (P-loop)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Title: The complete genome sequence of Escherichia A;Reference number: A64720; MUID:97426617 A;Accession: G64964
                                                                              밁
                                                                                                                      Qy
                                                                                                                                                                 밁
                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .A.; Rose, D.J.; Mau, B.; Shao, Science 277, 1453-1462, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Residues: 1-1091 <BLAT>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Status: nucleic acid sequence not shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   R; Blattner, F.R.;
                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local (
                                                                                                                                                                                                           118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     331
                                                                                187
                                                                                                                                                                 132
                                                                                                                                                                                                                                                     108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             671 KDSIALGY 678
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    391
                                                                                                                                                                                                                                                                                                                                        57
                                                                                                                                                                                                                                                                                                                                                                                 1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                                                                                                                                                                                                                                     VVHPGETVNGGTLANHDNQIVFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A-SASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LDGVTASVNDVAASVKKIVGTIQITGSGVASAIGKDSTATGASAQAVGDSSVALGTRATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MTPQFSSVSLGAGADAPTLSV----DGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQ 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVALGSGSMASEPNVVSVGSGDGLRGPAVRRIVNVGDGIGNNDAVNKSQLDGVTASVNDV
V--VKPGTVATDTV--VNTGAEGGPDAENGDTGQFVRGDAVRTTIN----KNGRQIVRAE
                                     IKGVKPGTTASDNVDFVRT-----YDTVEFLSADTKTTTVNVESKDNGKKTEVKI 274
                                                                                SAGG-GQSLQGRAVNTTLNGGEQWMHEGAIATGTVINDK
                                                                                                                      HLNGIGSTL----TDTLLNTG------ATTNVTNDNVTDDEKKRAASVKDVLNAGWN 224
                                                                                                                                                                    --TNGMTISTGLEYGPDNEANTGGQWVQDGGTANKTTVTSG--GLQ-RVNPGGSVSDTVI 18
                                                                                                                                                                                                       IKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTV
                                                                                                                                                                                                                                                                                            YLDPVQRTVAVLIVNSDKE----GTGEKEKVEENSDWAVYFNEKGYLTAREITLKAGDNLK 117
                                                                                                                                                                                                                                                                                                                                        LNTCYRLVWNHMTGAFVVASELARARGKRGGVAVALSLAAVTSLPVLAA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NAIGSSVLGVDSRARGINSTALGRQSNAIGDGSVSLGFNSFVRQSGEHGVALGTDAGVSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LKGVAQNLNN---RIDNVDGNAR---AGIAQAI---ATAGLVQAYLPGKSMMAIG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IVSGVNSVALGAGSVASELNVISVGGGDGVTGPAVR----RIVNVGDGIGNNDAVNKSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LGVDGHALGANSTALGGQSTAISEGGTSLG---YNSFVGQSATNGIALGSN------A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WNLD-----SKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VASVKNIAGAIQITGSGVASVSGQDSTAAGASAQAAGDSSIA----LGARSRANAIGSSA 446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGQADKFETV--TSGTNVTFASGKGTTAT-VSKDDQGNITVMYDVNVGDALNVNQLQNSG 389
                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Plunkett III, G.; Mau, B.; Shao, Y.
                                                                                                                                                                                                                                                                                                                                                                                                                                             8.0%;
23.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -GGTYRGEAGYAIGYSSISDGGNWIIK-----GTASGNSRGHFG
                                                                                                                                                                                                                                                                                                                                                                                                                         71;
                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 239.5;
Pred. No. 0.0
                                                                                                                                                                                                                                                                                                                                                                                                     Pred. No. 0.00023;
Mismatches 202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bloch, C.A.; Perna, N.T.; Burland,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 1091;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PIDN: AAC75061.1; PID: g17883
                                                                                                                                                                                                                                                                                                                                        -----DI 107
                                                                                                                                                                                                                                                                                                                                                                                                                           205;
                                                                                GWO
                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             442
                                                                                227
                                                                                                                                                                                                                                                     131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   V.; Riley,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   495
                                                                                                                                                                                                                                                                                                                                                                                                                           35;
```

```
A; Molecule type: DNA
A; Residues: 1-1536 <BAR>
A; Cross-references: GB: U08876; GB: M84616; NID: g475770; PIDN: AAA20527.1; PID: g475771
A; Note: sequence inconsistent with the nucleotide translation
A; Note: sequence extracted from NCBI backbone (NCBIN: 89235, NCBIP: 89239)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  high-molecular-weight surface-exposed protein HMW1 - Haemophilus C;Species: Haemophilus influenzae C;Date: 10-Mar-1993 #sequence_revision 18-Nov-1994 #text_change C;Accession: A43855 R;Barenkamp, S.J.; Leininger, E. Infect. Immun. 60, 1302-1313, 1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
A43855
                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                          В
                                                                                                          Qy
                                                                                                                                                  밁
                                                                                                                                                                               8
                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                               Б
                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Reference number: A43855; A; Accession: A43855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    detella pertussis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
   밁
                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Title: Cloning, expression, and DNA sequence analysis
                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
Matches 133; Conserv
     1023
                                                                                                                                                                                                                            867
                                                                                                                                                                                                                                                                                                 821
                                                                                                                                                                                                                                                                                                                                   100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            425
                                       311
                                                                                                                                                  927
                                                                                                                                                                                    202
                                                                                                                                                                                                                                                             159
                                                                                                                                                                                                                                                                                                                                                                       778
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 280
                                                                                                                                                                                                                                                                                                                                                                                                          40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DALMLEKGSSFTLN
                                                                                                                                                                                                                                                                                                                                                                     SSLRFKTSGSTKTGFSIEKDLTLNATGGNITLLQV------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TLAGTTTLNNGAILTLSGKTVNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YAIGYSSISDGGNWIIKGTASGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDV
                                    KEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITV 370
                                                                                                                                                                                 DNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNV
                                                                                                                                                                                                                                                       ---TKGLNFAKE-----TAGTN-----GDTTVHLNGIGSTLTDTLLNTGAT-TNVTN
                                                                                                                                                                                                                                                                                               KGIVAKKNITFEGG------NITFGSRKAVTEIEG----NVTINNNANVTLIGSDF
                                                                                                                                                                                                                                                                                                                             KGVLTAREITLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSD-
                                                                                                                                                                                                                                                                                                                                                                                                      ATLLFATVQASANNEEQEEDLYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          G-----GTATT----VSMGNGG----VLLADSGAAVSGTRSDGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VVEGKADNV-VLENGG-RLD-------VLTGHTATN-----TRVDDGGTLDV-RN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KNGGVAGNTTVN-QKGRL-QVDAGGTATNVTLKQGGALVTSTAATVT----GINRLGAFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 G-AKTSVIKEKDGKLVTGKDKGENGSSTDE----GEGLV----TAKEVIDAVNKAGWRM-
                                                                                                              ESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK----
                                                                                                                                                SNIS--IAKGGARFKDIDNS----KNLSITTNSSS-----TYRTIISGNITNKNGDLNI
                                                                                                                                                                                                                       DNHQKPLTIKKDVIINSGNLTAGGNIVNIAGNLTVESNANFKAITNFTFNVGGLFDNKGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----KTTTANGQTGQADKFETVTSGTNVTFASG-----KGTTATVSKDDQG-NITVMYD
                                                                                                                                                                                                                                                                                                                                                                                                                                          7.7%; Score 232.5; DB 2; ilarity 22.3%; pred. No. 0.00078; Conservative 86; Mismatches 228;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---YAGGDQTVHGHALDTTLNGGYQYVHNGGTASDTV--VNSDGWQIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MUID:92192797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AGDTATDTT
-KELKLTQDLNI---SGFNKAEITAKD--GSDLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HMW1 - Haemophilus influenzae
                                                                                                          ----GENGSSTDEGEGLVTA
                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                     ----EGTDGMI----G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VNGGLFTARGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -AFSIGGGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1536;
                                                                                                                                                                                                                                                                                                                                                                                                                                            149;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              08-Oct-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   encoding nontypeable
                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                             866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           373
                                                                                                                                                                                  261
                                                                                                                                                                                                                       926
                                                                                                                                                                                                                                                         201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       384
                                                                          1022
                                                                                                                                                                                                                                                                                                                                                                                                                                            26;
```

```
A;Gene:
A;Start
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross references: GB:D85081; NID:g3041754
A;Experimental source: strain K-12
A;Note: sequence inconsistent with the nucleotide translation
A;Note: sequence extracted from NCBI backbone (NCBIN:88089, NCBIP:88090)
A;Note: sequence extracted from NCBI backbone (NCBIN:88089, NCBIP:88090)
A;Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.A.; Rose, D.J.; Mau, B.; Shao, Y.
Science 277, 1453-1462, 1997
A;Title: The complete genome sequence of Escherichia coli K-12.
A;Reference number: A64720; MUID:97426617
A;Accession: D64891
                                                                                     δÃ
                                                                                                                                        맑
                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 'M',915-2020 <BLA2>
A;Cross-references: GB:AE000237; GB:U00096; NID:g1787665; PIDN:AAC74487.1; PID:g17876
A;Cross-references: GB:AE000237; GB:U00096; NID:g1787665; PIDN:AAC74487.1; PID:g17876
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          R;Moszer, I.; Glaser, P.; Danchin, A.
Biochinie 73, 1361-1374, 1991
A;Title: Multiple IS insertion sequences near
A;Reference number: A48399; MUID:92190338
A;Accession: C48399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C;Species: Escherichia coli
C;Date: 19-Nov-1993 #sequence_revision
C;Accession: C48399; D64891; H64891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
Ş
                                             DЬ
                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: DNA
A; Residues: 1-839, 'LDLPLYFQTSVIT' <BLA1>
A; Cross-references: GB: AE000237; GB: U000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Cross-references: GB:AE000237; GB:U00096; NID:g1787665; A;Experimental source: strain K-12, substrain MG1655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ABC-type transport protein ydbA.2 - Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: nucleic acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Accession: H64891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Status: nucleic acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Residues: 464-2020 < MOS>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type:
                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1063
                                          243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          371
  165
                                                                                                                                        196
                                                                                                                                                                                                                             141 SFNN-----DVILDKTEKTLTIRDSVFTYTENADGTISLQDSNGRKATINLWQIDEANNT 195
                                                                                                                                                                                     93
                                                                                                                                                                                                                                                                             50
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ydbA_2
                                                                                                                                                                                                                                                                           SANNEEQEEDLYLDPVQRTV----AVLIVNSDKEGT-----GEKEKV-----EENSD 92
  AKETAGTNGDTTVHLNG-----IGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKD 217
                                                                                                                                        VALEGVSADGATKWQYNHNGELVI - - - - - TGDNATVNNNG - - - - - - KTTVDGKDSTGT 242
                                                                                                                                                                                WAV-----YFNEKGYLTAREITLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGT 141
                                                                                                                                                                                                                                                                                                                        167;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SSQSGDIGGTISGGTVEVKATESLTTQSNSKIKATTGEANVTSATGTIGGTISGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            G-----GGTYRGEAGYAIGYSSISDGGNWIIK-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGIESSSGSVTLTATEGALA-----VSNISGNTVTVTANSGALTTLAGSTIKGTESVTT 1226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IGNTNSADGTNAKKVTFNQVKDSKISADGHKVTLHSKVETSGSNNNTEDSSD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MYDVNVGDALNV-----NQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAG
                                             EINGNNGKVIQDGDLDVSGGGHGIDITGDSATVDNKGTMTVTDPESMGIQIDGDKAIVNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PGVK--EGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAI 543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NNAGLTIDAKNVTVNNNIT-SHKAVSISATSGEITTKT-GTTINATTGNVEITAQTGSIL 1172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVA 485
                                                                                                                                                                                                                                                                                                                   Similarity 23.667; Conservative
                                                                                          KLSFSANGNKVNITSDT----KG--
                                                                                                                                                                                                                                                                                                                                              7.4%;
                                                                                                                                                                                                                                                                                                                      75;
                                                                                                                                                                                                                                                                                                                   Score 221; DB
Pred. No. 0.00
75; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         not shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 not shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16-Oct-1998 #text_change
                                                                                                                                                                                                                                                                                                                                              221; DB 2;
No. 0.0041;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 col i
                                                                                                                                                                                                                                                                                                                          230;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         replication
                                                                                                                                                                                                                                                                                                                                                                 Length 2020;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 not
                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PIDN: AAC74483.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            terminus
                                                                                                                                                                                                                                                                                                                        236;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      08-Oct-1999
                                                                                          -LNF 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            577
                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ۷.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PID:g17876
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Riley,
                                                                                                                                                                                                                                                                                                                             40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <u>:</u>
```

```
RESULT 14

B43855

high-molecular-weight surface-exposed pro
C; Species: Haemophilus influenzae
C; Date: 10-Mar-1993 #sequence_revision 18
C; Accession: B43855
R; Barenkamp, S.J.; Leininger, E.
Infect. Immun. 60, 1302-1313, 1992
                                                                                                                                                                                                                                                                                                                                                                                             A; Note:
A; Note:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                           Ω
                                                                                                                                   밁
                                                                                                                                                                        δÃ
                                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type: DNA
A; Residues: 1-1477 <BAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Reference number: A43855; MUID:92192797
A;Accession: B43855
A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Title: Cloning, expression, detella pertussis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                δÃ
                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                303
                                                                                                                                                                                                                  821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         353
                    169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    751 GLELIGEKNALADGSQVTSLRTGYSYTSVIVVSGESSVYLNGDTTISG
                                                                                                                                                                                                                                                       11
                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                           sequence inconsistent with the nucleotide translation sequence extracted from NCBI backbone (NCBIN:89237, NCBIP:89240)
                                                                                                                                                                                                                                                       SALNAWVVVSELTRNHT----KRASATVKTAVLATLLFATVQASANNEEQEEDLYLDPVQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EGESTITNGGTGTQINGDDATANNNGKTTVDGKDSTGTEINGNNGKVIQD-----GDLD
                                                                                                                                                                        TVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITL---KAGDNLKIKQNGTN 124
                                                                                                                                                                                                                  NAINSTYNISILGGNVTLGGQNSSSSI-TGNITIEKAANVTLEANNAPNQQNI-RDRVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VYGSDNNVTLDGKLTVVSDSEVTSRQSNLFDGSAE-----KTSGLVVIGDGNTVNMNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---KEGDYTNVAQLKGVAQN-LNNRIDNV-DGNARAGIAQAIATAGLV------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NNNSVTLAAKDLKVVGQKATGINVSGDANTVNITGNVLVDKDKTADNAAEYFFDPSVGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DTGSIGVLINGEGATVSNTGDVNVS-NEATGFSITTNSGKVSLAGSMQVGDFSTGVDLNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSM-TPQFS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NSGKTTVDGKDSTGTKIAGNIGI----VNLDGSLTVTGGAHGVENIGDNGTVNNKGDIVVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKGTTATVSKDD-----QGNITVMYDVNVGDALNV----NQLQNSGWN--LDSK-----A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNKGTMTVTDPESIGIQIDGDQAIVNNEG---ESTITNGGTG-----TQINGNDAT-AN 521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EGEGLVTAKE-----VIDA----VNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NGDDATANNNGKTTV----DGKDSTGTEIAGNNGKVIQDGDLDVSGGGHGIDITGDSATV 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NGKKTEVKIGAKTSVIKEKDGKLVTGKD-KGENG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VSGGGHGI-DITGDSATVDNKGTMTVTDPESIGIQVDGDQAVVNNEGESAITNGGTGTQI 415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEF-LSADTKTTTVNVESKD-
                    AGTNGDTTVHLNGIGSTLTDTLLNTGATTNVT-
                                                        -NGTAEINITQ----GVVKLGNVTNDGDLNITTHAKRNQRSIIGGDIINKKGSLNI----
                                                                                               FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---SVSLGA-----GADAPTLSVDGDALNV---GSKKDNKPVRITNVA-----PGV---
                                                                                                                                     -LGSLLVNGSLSLTGENADI --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -QAYLPGKSMMAIGGGTYRGEAGYAI-----GYSSISDGGNWIIKG
                                                                                                                                                                                                                                                                                              Conservative
•••
                                                                                                                                                                                                                                                                                                                  22.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   E.
1992
and I
                                                                                                                                                                                                                                                                                            ; Score 220; DB 2;
; Pred. No. 0.0031;
92; Mismatches 23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18-Nov-1994 #text_change 18-Nov-1994
                                                                                                                                   -KGNLTISESATFKGKTRDTLNITGNFTN
                                                                                                                                                                                                                                                                                                                                    DB 2; Length 1477;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     analysis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Haemophilus influenzae
                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     genes encoding nontypeable
                                                                                                 GLNFAKET
                    NDNVTDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSTD
                                                                                                                                                                                                                                                                                              Gaps
                                                                                                 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 302
                    208
                                                                                                                                                                                                                     878
                                                                                                                                                                                                                                                         67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   356
                                                            976
                                                                                                                                     925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              448
                                                                                                                                                                                                                                                                                                30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ηć
```

9

```
C;Accession: AF0394
R;Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, deno-Tarraga, A.M.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Status: preliminary
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1-1910 < KUR>
A;Cross-references: GB:AL590842; PIDN:CAC92482.1; PID:g15981183; GSPDB:GN00175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Reference number: AB0001;
A; Accession: AF0394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             deno-Tarraga, A.M.; Chillingworth, T.;
il, M.; Rutherford, K.; Simmonds, M.;
Nature 413, 523-527, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    probable adhesin hmwA [imported] - Yersinia pestis (strain CO92)
C;Species: Yersinia pestis
C;Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                            DЬ
                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Title: Genome sequence of Yersinia pestis, A; Reference number: AB0001; MUID:21470413; PM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 15
AF0394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вр
Qγ
                                           망
                                                                                Š
                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1036
                                           1043
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1316 AKDAKLNGDASGDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 977
                                                                                                                              991
                                                                                                                                                                                                                 954
                                                                                                                                                                                                                                                                                                  868
      219
                                                                                     160
                                                                                                                                                                                                                                                           52
                                                                                                                                                                                                                                                                                                                                          14 NAWVVVSELTRNHTKRASATVKTAVLATLLFATVQ-----
                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
nes 148; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hmwA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TANGQTGQADKFETYTSGTNYTFASGKGTTATYSKDDQGNITYMYDVNVGDALNVNQLQN 387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DSKISADGHNVTL---NSKVKTSSSNGGRESNSDNDTGLTITAKNV--EVNKDITSLKTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TKELKLTEDLSISGFN----KAEITAKDGRDLTIGNSNDGNSGAEAKTVTFN-----NVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TDSNNDAEIQIGGNISQKEGNLTISSDKINITKQITIKKGIDGEDSSSDATSNANLT-IK
                                                                                                                                                                                                                                                  NNEEQEEDLYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLK 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGNWIIKGTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSIN--AANVTLN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QFSSVSLGAGADAPTLSVDGDAL--NVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVA 503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NIT----ASEKVTTTAGSTINATNGKASITTKTGDISGTIS-----GNTVSVSA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGL-VTAKEVIDAVNKAGWRMKTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK 268
                                             TG----
                                                                                                                              AGNSKTATGPNINIENVNIETNNGNFT-----TNGITSTWLSGVNVSANG--VDITSNS
                                                                                                                                                                        AG----
                                                                                                                                                                                                                 NN - - -
                                                                                                                                                                                                                                                                                                     NATITANNISMN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --NGAEINATEGAATLTATGNTLTTEAGSS-----ITST----KGQVDLLAQNGSIA 1281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ---TVDLTTKSGSKIEAKSGEANVTSATGTIGGTI---SGNTVNVTANAGDLTVG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SGWNLDSKAVAGSSGKVISG--NVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTP
                                                                                   KGLNFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDV-
    -LNAGWNIKGV--KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVK
                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                TGGIVLDNTNILTTVGD---
                                                                                                                                                      -DNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDT 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              577
                                                                                                                                                                                                                                                                                                                                                                                                     7.3%;
                                                                                                                                                                                                                                                                                                  -GNITANDAVLMINTFLIAKGDIKIDLISPIKGLWFRGNGGMTAA 953
                                                                                                                                                                                                               --ILLVANS--TSSGETVKINASSS-----NKMNITAGKDISII 990
                                                                                                                                                                                                                                                                                                                                                                                     92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ·TTG-
                                                                                                                                                                                                                                                                                                                                                                                 Score 219; DB 2;
Pred. No. 0.0048;
2; Mismatches 255
                                                ---INT-IVTNSSGKGIWIKSNSTLNSNKDIT 1089
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          s, the causative agent of plague PMID:11586360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --TLTTVAGSDIKATSG----TLVIN 1315
                                                                                                                                                                                                                                                                                                                                                                                                                             Length 1910;
                                                                                                                                                                                                                                                                                                                                                                                        Indels 228;
                                                                                                                                                                                                                                                                                                                                              -----ASA
                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1141
                                                                                                                                   1042
          273
                                                                                                                                                                                                                                                                                                                                              51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           327
                                                                                                                                                                                                                                                                                                                                                                                          28;
```

Db 1	Qy	₽ 2y	Qy Db 1	Db 1	Db 1	Оу 1	Oy Db 1	Db :	Db
1547 GIG	577	521 1487	461 1428	418 1368	400 1308	371 1248	330 1188	274 1138	1090
GIG 1549	SRG 579	IAQAIATAGL-VQAYLPGKSMMAIGGGTYRGEAGYAIGYSS-ISDGGNWIIKGTASGN 5	LSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAG E	ETVNINAGNNIEITRNGKNIDIA-TSMTPQFSSVSLGAGADAPT 460 : : :		MYDVNVGDALNVŃQLQNSGWNLDSKAVAG399 	TSLNAVLSLGGNNSIKAQNGWLIGKAFNTTOGAGIGFRANSSLSVDGNIILKGETEGVGA 1247	IGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTA 3:	1090 LVGVSAGQN-EGVIIQGSSDASRNNISAQGNITLIGKMGNGSGQHSLIN 1137
		576 1546	520 . 1486	460 1427	417 1367	399 1307	370 1247	329 1187	137

Search completed: July 3, 2002, 08:11:59 Job time: 421 sec

THIS PAGE BLANK (USPTO)

# GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.

OM protein - protein search, using sw model

Run on: July 3, 2002, 08:10:29; Search time 48.34 Seconds (without alignments) 473.381 Million cell updates/sec

Title:
Perfect score:
Sequence:

US-09-771-382-1 3003 1 MNKIYRIIWNSALNAWVVVS.....TASGNSRGHFGASASVGYQW 591

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

105224 seqs, 38719550 residues

Searched:

Total number of hits satisfying chosen parameters: 105224

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database : Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution. SwissProt\_40:\*

#### SUMMARIES

ω ω	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	υı	4	w	2	1		Result
158	159	159	159.5	160.5	161.5	161.5	163	166	166.5	167	172.5	174	175.5	180	180	180.5	180.5	181	181.5	182	183	185	186.5	189.5	191	191.5	201	206	207.5	216.5	221	239.5		600
υ		5.3				5.4	5.4	5.5	٠	5.6		٠			٠					•	6.1	6.2	6.2	٠	6.4	6.4	6.7	6.9	•	7.2	7.4	8.0	Eld CCIT	
497	928	671	642	444	1637	1300	550	1025	1148	1643	2021	918	1567	2334	1861	1569	928	1656	933	917	1007	1645	1655	1953	2249	1608	1654	1325	1577	1286	2003	1039	TOTAL CITY	
1	1	L	1	ш	1		ب	L	1	1	س	1	μ.	_	_	ш	_	ب	_	ш	_	L	_	_	_	_	_	_	_	Н	ب	ب	1 5	2
FLIC_ECOLI	PM10_CHLPN	ALYS_ENTFA	FLID_CAMJE	SLAP_LACAC	MRSP_STAAU	120K_RICRI	FLIC_SHIFL	SLAP_CAUCR	ICEK_PSESX	OMPB_RICPR	OMPA_RICCN	YMJB_CAEEL	ICEN_XANCT	WAPA_BACSU	APU_THETU	YPJA_ECOLI	HXA2_HAEIN	OMPB_RICJA	SLAP_CAMFE	HXA3_HAEIN	Y741_CHLMU	OMPB_RICTY	OMPB_RICCN	BIGA_SALTY	OMPA_RICRI	HLYA_SERMA	OMPB_RICRI	YDEK_ECOLI	HLYA_PROMI	AIDA_ECOLI	YDBA_ECOLI	AG43_ECOLI	)	7
μ.		P37710 enterococcu		P35829 lactobacill	P80544 staphylococ		Q08860 shigella fl		O30611 pseudomonas	Q53020 r outer mem	Q52657 rickettsia	7	7 xanthomo		o,	P52143 escherichia	42	ω	P35827 campylobact	P45355 haemophilus		P96989 r outer mem	Q9kka3 r outer mem	7	1 rickettsi		7	_	σ	σ,	P33666 escherichia	P39180 escherichia	הפפעד דמרדטוו	

Uerropacce	Q9ZKW3	VACA_RELPJ	۰	1788	J. L	154	Ü
hall sahaaka			٠.	1	1		,
escherichia	P45508	YFAL_ECOLI	_	1250	5.1	154.5	44
caulobacter		FLEY_CAUCR	-	954	5.1	154.5	43
deinococcus	P56867	HPI1_DEIRA	_	948	5.1	154.5	42
salmonella		FLIC_SALON	ᆫ	507	5.1	154.5	41
saccharomyc		NUP1_YEAST	_	1076	5.2	155.5	40
pseudomonas		ICEN_PSESY	μ.	1200	5.2	156	39
saccharomyc		YG4A_YEAST	-	817	5.2	156.5	38
pseudomonas		ICEV_PSESX	Ĺ	1196	5.2	157	37
plasmodium	P50493	PVDB_PLAKN	1	1153	5.2	157.5	36
haemophilus	P45384	IGA2_HAEIN	<b></b>	1702	5.3	158	S
haemophilus	P44969	IGAO_HAEIN	ш	1694	<b>5</b> .ω	158	34
	•						

## ALIGNMENTS

			2	RRRRRRRR	RRRRRRRR RA	RESULT AG43_EAG ID AG DT 0 DT 0 DT 1
SEQUENCE OF 53-63. STRAIN-K12 / EMG3; MEDLINE=97/443975; PubMed=9298646; Link A.J., Robison K., Church G.M.; "Comparing the predicted and observed properties of proteins encoded	PRELIMINARY SEQUENCE OF 53-78. STRAIN-ML 308-225; MEDLINE-89291704; PubMed=2661530; Caffrey P., Owen P.; "Purification and N-terminal sequence of the alpha subunit of antigen 43, a unique proteoin complex associated with the outer membrane of Escherichia coll."; J. Bacteriol. 171:3634-3640(1989).	SEQUENCE FROM N.A. STRAIN-ML 308-225; Henderson I.R., Owen P.; Submitted (JAN-1997) to the EMBL/GenBank/DDBJ databases. [4]	H., Kitaka H., Mori io Y., Os agami H., chi T.; ence of t he 40.1-s (1996).	ao Y.; ete genome sequence of Escherichia coli K-12."; 7:1453-1474(1997). ROM N.A.; 751358; PubMed=9097040; 1ba H., Baba T., Fujita K., Hayashi K., Inada T., Isc	ESCRETICHIA.  NCBL_TAXID=562; [1] [1] [1] [1] [1] [1] [1] [1] [1] [1]	ECOLI  AG43_ECOLI  AG43_ECOLI  STANDARD;  PRT; 1039 AA.  P39180; P76360; P75614; P97241; Q46771;  O1-FEB-1995 (Rel. 31, Created)  O1-NOV-1997 (Rel. 35, Last sequence update)  16-OCT-2001 (Rel. 40, Last annotation update)  Antigen 43 precursor (AG43) (Fluffing protein).  ELU OR B2000.  Escherichia coli.  Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;

```
멍
                                           Ωy
                                                                                              망
                                                                                                                                         Q
                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                    VARIANT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT
VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EN the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content modified and this statement is not removed. Usage by and entities requires a license agreement (See http://www.isb-sor send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CHAIN
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENE NAME.
MEDLINE=97257509; PubMed=9103983;
Henderson I.R., Meehan M., Owen P.;
"Antigen 43, a phase-variable bipartite outer membrane protein,"
"Antigen 43, a phase-variable bipartite outer membrane protein,"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     in the genome of Escherichia coli K-12.";
Electrophoresis 18:1259-1313(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Outer membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      σ
56
                                                61 YLDPVQRTVAVLIVNSDKE----GTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLK 117
                                                                                                رح.
                                                                                                                                              \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SUBCELLULAR SIMILARITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SUBUNIT: HETERODIMER OF THE PERIPHERAL MEMBRANE CHAIN) ANCHORED TO THE INTEGRAL OUTER MEMBRANE !
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FUNCTION AS AN ADHESIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Microbiol. Lett.
                                                                                                                                              MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                LNTCYRLVWNHMTGAFVVASELARARGKRGGVAVALSLAAVTSLPVLAA-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AB000291; AAC75061.1; ALT_INIT.
D90838; BAA15825.1; ALT_INIT.
D90839; BAA15832.1; ALT_INIT.
U24429; AAB47869.1; -.
                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EG12686; flu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               157
188
303
303
320
372
493
497
709
709
721
721
751
805
815
                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONTROLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LOCATION: OUTER MEMBRANE
TO ADHESIN AIDI-I AND TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Signal;
                                                                                                                                                                                                                                                                                                                       AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      551
1039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             149:115-120(1997)
                                                                                                                                                                                                                                                                                                                       106841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COLONY FORM
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ALPHA CHAIN.

K -> N (IN STRAIN ML 308-225).

SL -> FF (IN STRAIN ML 308-225).

T -> K (IN STRAIN ML 308-225).

W -> L (IN STRAIN ML 308-225).

V -> F (IN STRAIN ML 308-225).

ATN -> STI (IN STRAIN ML 308-225).

A -> T (IN STRAIN ML 308-225).

N -> Q (IN STRAIN ML 308-225).

S -> N (IN STRAIN ML 308-225).

F -> Y (IN STRAIN ML 308-225).

S -> N (IN STRAIN ML 308-225).

H -> Y (IN STRAIN ML 308-225).

H -> Y (IN STRAIN ML 308-225).

Y -> S (IN STRAIN ML 308-225).

Y -> S (IN STRAIN ML 308-225).

** O (IN STRAIN 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Complete proteome
                                                                                                                                                                                            Score 239.5;
Pred. No. 9.1e
71; Mismatches
                                                                                                                                                                                                                                                                                                                         MW;
                                                                                                                                                                                                                                                                                                                                           ATN -> STI
A -> 7 (IN
N -> 0 (IN
S -> V (IN
S -> V (IN
S -> F (IN
H -> Y (IN

                                                                                                                                                                                                                                                                                                                 9T -> LGA (IN STRAIN ML 308-225).
-> T (IN STRAIN ML 308-225).
-> I (IN STRAIN ML 308-225).
-> I (IN STRAIN ML 308-225).
-> I (IN STRAIN ML 308-225).
TV -> TTT (IN REF. 5).
5170D647C8DEEBEO CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIATION AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ASSOCIATED.
BORDETELLA PERTACTIN
                                                                                                                                                                                                                           .1e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEMBRANE PROTEIN
                                                                                                                                                                                                                                               DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AUTOAGGREGATION. MAY
                                                                                                                                                                                                                                               Length 1039
                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROTEIN (ALPHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    he EMBL outstation restrictions on 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         and
                                                                                                                                                                                                 205;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (BETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for
                                                                                                   Ż
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                coli
                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      commercial
                                                                                                                                                 60
                                                                                                   55
       79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                way
                                                                                                                                                                                                 35
```

```
RESULT 2
YDBA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ω
                                                                                                                                                                                          B
                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                               No.
                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                 g
                                                                                                                                                                                                                                                                              434
                                                                                                                                                                                                                                                                                                           333
                                                                                                                                                                                                                                                                                                                                                                                                   325
                                                                                                                                                                                                                                                                                                                                                                                                                               228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          118
                                                                                                                                                                                                                       494
                                                                                                                                                                                                                                                   373
                                                                                                                                                                                                                                                                                                                                          374
                                                                                                                                                                                                                                                                                                                                                                      279
                                                                                                                                                                                                                                                                                                                                                                                                                                                          275
                                                                                                                                                            554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IKGVKPGTTASDNVDFVRT------YDTVEFLSADTKTTTVNVESKDNGKKTEVKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTV
                                                                                                                                                                                                                                                                GKNIDIATSMTPQESSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDV
                                                                                                                                                                                                                                                                                                                                    VNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN
                                                                                                                                                                                                                                                                                                                                                                                                  -----KTTTANGQTGQADKFETVTSGTNVTFASG----KGTTATVSKDDQG-NITVMYD
                                                                                                                                                                                                                                                                                                                                                                                                                               GTANTTVV-----YAGGDQTVHGHALDTTLNGGYQYVHNGGTASDTV--VNSDGWQIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                         G-AKTSVIKEKDGKLVTGKDKGENGSSTDE----GEGLV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        V--VKPGTVATDTV--VNTGAEGGPDAENGDTGQFVRGDAVRTTIN----KNGRQIVRAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HLNGIGSTL----TDTLLNTG-----ATTNVTNDNVTDDEKKRAASVKDVLNAGWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --TNGMTISTGLEYGPDNEANTGGQWVQDGGTANKTTVTSG--GLQ-RVNPGGSVSDTVI
                                                                                                                                                                                          DALMLEKGSSFTLN----
                                                                                                                                                                                                               TNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAG
                                                                                                                                                                                                                                                 G-----GTATT-----VSMGNGG----VLLADSGAAVSGTRSDGK-----AFSIGGGQA
                                                                                                                                                                                                                                                                                                                                                                    KNGGVAGNTTVN-QKGRL-QVDAGGTATNVTLKQGGALVTSTAATVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SAGG-GQSLQGRAVNTTLNGGEQWMHEGAIATGTVINDK-
                                                                                                                                 TLAGTTTLNNGAILTLSGKTVNN
                                                                                                                                                            YAIGYSSISDGGNWIIKGTASGN
                                                                                                                                                                                                                                                                                                             VVEGKADNV-VLENGG-RLD
                                           STANDARD; PRT; 2003 AA. P76088; P76856; P76857; P76859;
                                                                                                                                                              576
                                                                                                                                                                                           AGDTATDTT---
                                                                                                                                                                                                                                                                                                             ·VLTGHTATN-----TRVDDGGTLDV-RN
update)
                                                                                                                                                                                             -----VNGGLFTARGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                              TAKEVIDAVNKAGWRM-
                                                                                                                                                                                                                                                                                                                                                                      -GINRLGAFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           177
                                                                                                                                                                                                                        553
                                                                                                                                                                                                                                                      412
                                                                                                                                                                                                                                                                                   493
                                                                                                                                                                                                                                                                                                                                             433
                                                                                                                                                                                                                                                                                                               372
                                                                                                                                                                                                                                                                                                                                                                       332
                                                                                                                                                                                                                                                                                                                                                                                                                                  278
                                                                                                                                                                                                                                                                                                                                                                                                                                                               324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        274
```

```
ALD DE COMPANIA DE
MEDLINE-97251357; PubMed=9097039;
MEDLINE-97251357; PubMed=9097039;
Alba H., Babba T., Fujita K., Hayashi K., Inada T., Isono K., Itoh Kasai H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M.,
Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K.,
Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito
Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J.,
Takemoto K., Takeuchi Y., Wada C., Yanamoto Y., Horiuchi T.;
"A 570-kb DNA sequence of the Escherichia coli K-12 genome
corresponding to the 28.0-40.1 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gregor J.
Mau B., S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TDBA_ECOLI STANDARD; PRT; 20
P33666; P76087; P76088; P76856; P76857
01-FEB-1994 (Rel. 28, Created)
16-OCT-2001 (Rel. 40, Last sequence up
16-OCT-2001 (Rel. 40, Last annotation
Hypothetical protein ydbA.
YDBA OR B1401/B1405.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Bur-
Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
STRAIN-K12 / MG1655;
MEDLINE-97426617; PubMed-9278503;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-K12
                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "The complete genome sequence of Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Shao
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ., Davis N.W., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Escherichia coli K-12.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rose D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Burland V
yhew G.F.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ۲.
                                                                                                                                                                                                                                                                                                                                <u>.</u>
```

```
DЬ
                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                   Ş
                                     밁
                                                          Ş
                                                                                   밁
                                                                                                        δÃ
                                                                                                                                 밁
                                                                                                                                                      Q
                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                20
            Š
                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hypothetical CONFLICT 4 CONFLICT 4 SEQUENCE 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; AE000237; AAC74483.1; ALT_SEQ. EMBL; AE000237; AAC74487.1; ALT_SEQ. EMBL; D90778; BAA15009.1; ALT_SEQ. EMBL; D90778; BAA18880.1; ALT_SEQ. EMBL; D90779; BAA18881.1; ALT_SEQ. EMBL; X62680; ; NOT_ANNOTATED_CDS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        use by non-profit institutions as long as its content modified and this statement is not removed. Usage by ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Moszer I., Glaser P., Danchin A.; "Multiple IS insertion sequences near the replication Escherichia coli K-12.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EcoGene;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE-92190338; PubMed-1665988;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 464-2003 FROM
                                                                                                                                                                                                       218
              397
                                     522
                                                             353
                                                                                    472
                                                                                                           303
                                                                                                                                 416
                                                                                                                                                         266
                                                                                                                                                                                 357
                                                                                                                                                                                                                                303
                                                                                                                                                                                                                                                       165
                                                                                                                                                                                                                                                                             243
                                                                                                                                                                                                                                                                                                     142
                                                                                                                                                                                                                                                                                                                            196
                                                                                                                                                                                                                                                                                                                                                                           141
                                                                                                                                                                                                                                                                                                                                                    93
                                                                                                                                                                                                                                                                                                                                                                                                  50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Res.
VAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSM-TPQFS-
                                                                                                                                                                                                                                                                                                                           VALEGVSADGATKWQYNHNGELVI-----TGDNATVNNNG-----KTTVDGKDSTGT
                                                                                                                                                                                                                                                                                                                                                                         SFNN-----DVILDKTEKTLTIRDSVFTYTENADGTISLQDSNGRKATINLWQIDEANNT 195
                                                                                                                                                                                                                                                                                                                                                                                                 SANNEEQEEDLYLDPVQRTV----AVLIVNSDKEGT-----GEKEKV-----EENSD 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SWISS-PROT entry is copyright. It is produced through a ceen the Swiss Institute of Bioinformatics and the EMBL
                                     NSGKTTVDGKDSTGTKIAGNIGI----VNLDGSLTVTGGAHGVENIGDNGTVNNKGDIVVS
                                                                                  DNKGTMTVTDPESIGIQIDGDQAIVNNEG---ESTITNGGTG----TQINGNDAT-AN
                                                                                                                               VSGGGHGI-DITGDSATVDNKGTMTVTDPESIGIQVDGDQAVVNNEGESAITNGGTGTQI
                                                                                                                                                                                                      VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEF-LSADTKTTTVNVESKD-
                                                                                                                                                                                                                                                    AKETAGTNGDTTVHLNG-----IGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKD
                                                                                                        EGEGLVTAKE-----VIDA----VNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS
                                                                                                                                                        NGKKTEVKIGAKTSVIKEKDGKLVTGKD-KGENG------
                                                                                                                                                                                                                               EGESTITNGGTGTQINGDDATANNNGKTTVDGKDSTGTEINGNNGKVIQD-----
                                                                                                                                                                                                                                                                            EINGNNGKVIQDGDLDVSGGGHGIDITGDSATVDNKGTMTVTDPESMGIQIDGDKAIVNN
                                                                                                                                                                                                                                                                                                                                                                                                                          167;
                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EG11307; ydbA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3:363-377(1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                  ----YFNEKGVLTAREITLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGT
                                                                                                                                                                                                                                                                                                    -KLSFSANGNKVNITSDT----KG----
                                                                                                                                                                                                                                                                                                                                                                                                                                    7.4%;
                                                          QGNITVMYDVNVGDALNV----NQLQNSGWN--LDSK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                        75;
                                                                                                                                                                                                                                                                                                                                                                                                                                    Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  > V (IN REF. 2).
> V (IN REF. 2).
B83A12C8B53220EE
                                                                                                                                                                                                                                                                                                                                                                                                                        221; DB 1; I
NO. 0.0016;
smatches 230;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (See http://www.isb-sib.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 2003;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   terminus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and
                                                                                                                                                                                                                                                                                                                                                                                                                        236;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          collaboration
                                                                                                                                                                                                                               -GDLD
                                                                                                                                                        SSTD
                                                                                                                                                                                                                                                                                                  -LNF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ĺ'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ä
                                                          À
                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                 471
                                                                                                                                                                                                                                                                                                                                                   141
                                    578
                                                                                  521
                                                                                                                                                                                                                                                    217
                                                                                                                                                                                                                                                                            302
                                                                                                                                                                                                                                                                                                    164
                                                                                                                                                                                                                                                                                                                           242
             448
                                                           396
                                                                                                          352
                                                                                                                                                                                                       265
                                                                                                                                                                                                                              356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 no on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 way
                                                                                                                                                                                                                                                                                                                                                                                                                        40;
```

```
AIDA_ECOLI
ID AIDA_ECOLI
ID AIDA_ECOLI
ID AIDA
AC Q0315
DT 01-JU
DT 01-JU
DT 01-JU
DT AIDA-
OS Esche
OC Bacte
OC Bacte
OC NESCHE
OC NESC
                                                                                      Š
                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
Š
                                             멍
                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                               Query Match
Best Local S
Matches 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and for entitles requires a license agreement (See http://www.isb-sib
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A., AND SEQUENCE STRAIR-2787 (0126:H27);
MEDILINE-92326638; Pubmed-1625582;
Benz I., Schmidt M.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-JUN-1994 (Rel. 01-JUN-1994 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            synthesized via a precursor molecule. Mol. Microbiol. 6:1539-1546(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "AIDA-I, the adhesin involved in diffuse adherence of the diarrhoeagenic Escherichia coli strain 2787 (0126:H27),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q03155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AIDA_ECOLI
                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                        PROPEP
                                                                                                                                                                                                                                                                                                                                                                                                                   SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; X65022; CAA46156.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -1- FUNCTION: THIS IS AN ADHESION ADHERENCE OF DIARRHEA-CAUSING TO EPITHELIAL CELLS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Plasmid pIB6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AIDA-I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Adhesin aidA-I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  579
  91
                                                61
                                                                                           52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SUBCELLULAR LOCATION: Outer membrane.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SWISS-PROT entry is copyright. It is produced through a collable of the Swiss Institute of Bioinformatics and the EMBL outst European Bioinformatics Institute. There are no restrictions by non-profit institutions as long as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                         adhesion;
                                                                                                                                                                                 MNKIYRIIWNSALNAWVVVSELTRNH-----TKRASATVKTA--VLATLLFATVQASA 51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S28634; S28634.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GLELIGEKNALADGSQVTSLRTGYSYTSVIVVSGESSVYLNGDTTISG
  SDWAVYFNEKGVLTAREIT - - -
                                             TVSSGETQIVYSGRGNSNATVNSGGTQIVNNGGKTTATTVNSSGSQNVGTSGATISTIVN
                                                                                                                                           MNKAYSIIWSHSRQAWIVASELARGHGFVLAKNTLLVLAVVSTIGNAFAVNISGTVSSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VYGSDNNVTLDGKLTVVSDSEVTSRQSNLFDGSAE-----KTSGLVVIGDGNTVNMNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NNNSYTLAAKDLKVVGQKATGINVSGDANTVNITGNVLVDKDKTADNAAEYFFDPSVGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---SVSLGA-----GADAPTLSVDGDALNV---GSKKDNKPVRITNVA-----PGV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DTGSIGVLINGEGATVSNTGDVNVS-NEATGFSITTNSGKVSLAGSMQVGDFSTGVDLNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -QAYLPGKSMMAIGGGTYRGEAGYAI-----GYSSISDGGNWIIKG
                                                                                                                                                                                                                                 145;
                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                1286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (Rel.
                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                     ء
50
                                                                                                                                                                                                                                                                                                                                                                                                                                         Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                  AA;
                                                                                                                                                                                                                                                                                                                                                                        1286

    Last sequence update).
    Last annotation update)

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       29,
                                                                                                                                                                                                                                                                                                                                                                                                                     49
                                                                                                                                                                                                                                                    7.2%;
                                                                                                                                                                                                                                                                                                                                                132271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                           Outer membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gamma
                                                                                                                                                                                                                               94;
                                                                                                                                                                                                                                                                                                                                                WW.
                                                                                                                                                                                                                                                       Score 216.5;
Pred. No. 0.0
                                                                                                                                                                                                                                                                                                                                                                                                ADHESIN AIDA-I.
  ---LKAGDNLKIKQNGTNFTYSLK-KDLTDLTSVGT 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        subdivision;
                                                                                           YLDPVQRTVAVLIVNSDKEGTGEKEKVEE---N
                                                                                                                                                                                                                                                                                                                                                B2A00F72AC05FB34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROTEIN NECESSARY
ENTEROPATHOGENIC F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1286
                                                                                                                                                                                                                                                                                                                                                                                                                                           Plasmid
                                                                                                                                                                                                                               b; DB 1;
0.0015;
nes 273;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                  CRC64;
                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ESCHERICHIA COLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the
'), is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 571
                                                                                                                                                                                                                                 171;
                                                                                                                                                                                                                                                                               1286;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     outstation
                                                                                                                                                                                                                                 Gaps
                                             120
                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     488
                                                                                           90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ņ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       way
                                                                                                                                                                                                                                    29;
```

```
HLYALPM I
HLYALPM I
ID HLYALP
ID HLYALP
ID HLYALP
ID H16466
DT 01-AUG
DT 01-NOV
DE Hemoly
GN HPMA.
OS PROTEGU
OC PROTEGU
OX NCBI_T
RN [1]
RP SEQUEN
RC STRAIN
RX MEDLIN
RX MEDLIN
RX MEDLIN
RY SELTAT
"Nucle
RT "Nucle
RT "Nucle
CC -i - FU
CC DE
CC C E
CC C E
CC C -i - FU
CC -i - SU
CC -i - SU
CC -i - SU
CC -i - M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                    P16466;
01-AUG-1990 (Rel. 15, C
01-AUG-1990 (Rel. 15, I
01-NOV-1990 (Rel. 16, I
                                                                                                                                              Uphoff T.S., Welch R.A.;
"Nucleotide sequencing of the Proteus mirabilis calcium-independent "Nucleotide sequencing of the Proteus mirabilis calcium-independent hemolysin genes (hpmA and hpmB) reveals sequence similarity with the Serratia marcescens hemolysin genes (shlA and shlB).";
J. Bacteriol. 172:1206-1216(1990).
-!- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                              SEQUENCE FROM N.A., AND SEQUENCE STRAIN-ISOLATE 477-12;
MEDLINE-90170827; PubMed-2407716;
Uphoff T.S., Welch R.A.;
                                                                                                                                                                                                                                                                                                                                                                                                       Proteus mirabilis.
                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=584;
                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                      Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HLYA_PROMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                  MAY BE RESPONSIBLE FOR PORE FORMATION. SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA)
                                                  SUBCELLULAR LOCATION: Outer membrane.
MISCELLANEOUS: THE CONSERVED AMPHIPATHIC DOMAINS
                                                                                                                       DEFINED. FUNCTION: CELL-BOUND HEMOLYSIN,
                                                                                      REQUIRES HPMB FUNCTION
                                                                                                        ERYTHROCYTES BY INTERACTION WITH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KEGDYTNVAQLKGVAQNLNNRIDNVDGNARA-----GIAQAIATAGLVQAYLPGKSMMAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VISGNVSPSKGKMDETVNINAGN---NIEITRNGKN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN------GIGSTLTDTLLNTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SGGIQRYSSGGVASATNISGGAQNIYNIGHASNTVIFSGGNQTIFSGGITDSTNISSGGQ 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGGTYRGEAGYAIGYSSISDGGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TDGTVLNSGGLQAVSSG-----GKASATVINEGGAQFVYDGGQV----TGTNIK--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INSGGTAPVQNSVVVTRTVSSAAKPFDAEVYSGGKQTVYLWRGIWYSNFLTAVWSMFPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TLRVLSDGYARGTILNNSGRENVSNGGVSYNAMINTGGNQYIYSDGEATAAIVNTSGFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TATVSKDDQGNITVMYD---VNVGD-ALNVNQLQNSGWNL-----DSKAVAGSSG--K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----QIVNSEGTAINTLVSDGGYQHIRNGGIASGTIVNQSGYVNISSGGYAESTIINSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TDTTVNSGGNQNISSGGIVSETTVNVSGTQNIYSGGSALSANIKGS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KTTTVNVESKDN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATTNYTNDNYTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QRV--SSGGVASNTTINSSG---AQNILSEEGAISTHISSGGNQYISAGANATETIVNSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NGGTIRVDSGASALNIALSSGGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ASGANVNLSGRLNAFAGNVVGTILNQEGRQYVYSGATATSTVGNNEGREYV----LSGGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEVIDAVNKAGWRMKTTTANG-----QTGQADKFETVTSGTNVTFASG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SS---VSLGAGADAPTLSVDGDALN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      - AVATGTVLSGG--TQNVSSGGSAISTSVXNSGVQTV-FAGATV
                                                                                                                                                                                                                                                                                                                                                                                     gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 629
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                       subdivision;
                                                                                                                                                                                                                                                                                                                    엵
                                                                                                                          WHICH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1577
                                                                                                                                                                                                                                                                                                                    30 - 43
                                                                                                          THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ------VGSKKDNKPVRITNVAPGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                          ERYTHROCYTE
                                                                                                                        RELEASES HEME-IRON FROM
                                                                                                                                                                                                                                                                                                                                                                                         Enterobacteriaceae;
                                                      Ï
                                                                                                          MEMBRANE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IDIATSMTPQF
                                                    SHLA AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -KGT
                                                      HPMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     329
```

```
RESULT
YDEK_ECOLI
ID YDEK_ECOLI
P32051; P76140; P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                            밁
                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                       QY
                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20
                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; M30186; AAA25657.1; PIR; A35140; A35140.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hemolysis;
                                                                                                                                                                534
                                                                                                                                                                                                                          480
                                                                                                                                                                                                                                                        823
                                                                                                                                                                                                                                                                                      449
                                                                                                                                                                                                                                                                                                                                                                              710
                                                                                                                                                                                                                                                                                                                                                                                                          332
                                                                                                                                                                                                                                                                                                                                                                                                                                        650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        306 ITVNNSGSSQTLTKTELKGKNI--TLVASSHNQIKASDLMGDDITLQGADLTIDGKQLQQ
                                                                                                                                    931
                                                                                                                                                                                              881
                                                                                                                                                                                                                                                                                                                  768
                                                                                                                                                                                                                                                                                                                                                390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22 LTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDLYLDPVQRTVAVLIVNSDK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KETDIDNRWFYSWKYDVTKEKEQIQQIGSQIDAKNNATLTATKGDVTLDAAKINAGNNLA 423
                                                                                                                                                                                                                                                        KDLLHEGASHHVEGRYQESGENIQHLAVNDSETSKT--DSLNVGIDVGVNLDYSGVTKPV
                                                                                                                                                                                                                                                                                                                                                                              TSTETEQANSTISGANVDLQANKDVTFAGSDLKTTAGNASITGD-NVAFVSTENKKQTD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VTGKDK-----GE-NGSST-----DEGEGLVT---AKEVIDAVNKAGWRMKTTTANG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNALSETISKIDERTGTAFNITKSSHKNETNKQTSTGSELISDAQLTVVSGNDVNVIGSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGGQNKNNNNQQQVSHATQLTADGQLLLAADNNVNITGSQVKGNQGAFVK--TTQGDVVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GATTNVTNDN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ELTAGKDLGLDAQGSITAQGAKLHANENVLVNAKDNINLNVQKTNNDKTVTDNHVMWGGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KETAG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IKQNGTNFTYSLKKDLTDLTSVG-TEKLSFSANGNKVNITS------
                                                                                                                                                              YLPGKSMMAIGGGTYRGEAGYAIGYSSISDG
                                                                                                                                                                                            KKAIEDGVNTTKPG-NNTDLTKKVTARDAIANLAN-LSNLE-TPNVGVEVGIK---
                                                                                                                                                                                                                          R\hbox{----} ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                                                                                                                                                              WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN-GKNIDIATSMTPQFS
                                                                                                                                                                                                                                                                                                                                                                                                         QTGQADKFETVTSGTNVTFASGKGTTATVS--KDDQGNITVMYDVNVGDALNVNQLQNSG
                                                                                                                                                                                                                                                                                                                                                                                                                                      \tt IKSADKLGIHSLGDINVKSAQQVTKIDDEKTSLAITGHAKEVEDKQYSAGFHITHTINKN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FVRTYDTVEFLSAD-----TKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD----GKL
                                                                                                                                                                                                                                                                                                                  -NTDTTISGGFS----YTGGVDKVGSKADFQYD-KQHTQTEVTKNRGSQTEVAGDLTITAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            30
1577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Toxin; Outer membrane; Signal 1 29 1 29 HEMOLYSIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                    -GGGSQQSQTDSQAVSTSINAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---KDIHINGLVEKESRSENGNKRNHTSRLESGSWSNSHQTETLKAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -EGTGEKEKVE-----ENSDWAVYFNEKGVLTAREITLKAGDNLK 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           rmatics Institute. There are no rest institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -------TNGDTTVHLN----GIGSTLTDTLL---NT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              165869 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -VTDDEKKRAASVKDVLNAGWNIKG-----VKPGTTASDNVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ,
98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 207.5; DB Pred. No. 0.0054;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              175975E0C924B2D9
                                                                                                                                                                                                                                                                                      DAPTLSVDGDALNVGSKKD-----NKPV
                                                                                                                                    951
                                                                                                                                                                 564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    258;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---DTKGLNFA 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    193;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               is in no way for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                             533
                                                                                                                                                                                                                                                                                       479
                                                                                                                                                                                                                                                                                                                     822
                                                                                                                                                                                                                                                                                                                                                  448
                                                                                                                                                                                                                                                                                                                                                                                                            389
                                                                                                                                                                                                                                                                                                                                                                                                                                          709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          363
                                                                                                                                                                                               930
                                                                                                                                                                                                                                                           880
                                                                                                                                                                                                                                                                                                                                                                              767
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    32;
```

STANDARD; ; P77168;

PRT;

1325

₽

Match

DB

Length

1325;

```
EMBL; AE000248; AAC74583.1; EMBL; D90793; BAA15190.1; AL7
EMBL; D90794; BAA15197.1; AL7
EMBL; D90794; BAA15197.1; AL7
EMBL; X73295; CAA51730.1; AL7
PIR; S34315; S34315.
EcoGene; EG11780; ydeK.
                  CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Aiba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Ito Kasai H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K. Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saisampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Takeuchi Y., Mada C., Yamamoto Y., Horiuchi T., "A 570-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 28.0-40.1 min region on the linkage map."; DNA Res. 3:363-377(1996).
                                                                                                                                                                                                                                                                                                                                                                               the European Bioinformatics Institute. There are no rest use by non-profit institutions as long as its content modified and this statement is not removed. Usage by an entitles requires a license agreement (See http://www.isb-or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cartwright P.J., Timms M.W., Lithgow T., Hoej P.B., Hoogenraad "An Escherichia coli gene showing a potential ancestral relation to the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for the mitochondrial import site proteins ISP42 of the genes for t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "The
                                                                                                              CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=94100243; PubMed=8274505;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F. Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-1993 (Rel. 27, Created)
01-NOV-1997 (Rel. 35, Last sec
16-OCT-2001 (Rel. 40, Last ann
Hypothetical lipoprotein ydek
TDEK OR ORFT OR B1510.
                                                                                                                                                         Hypothetical protein; Membrane; Lipoprotein; Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Biochim.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOM38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF 595-1325 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=97251357;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-K1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=97426617; PubMed=9278503;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Escherichia coli
                                                                                                                                                                                                        PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=562;
                                                                                         LIPID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SIMILARITY: TO E. SIMILARITY: SOME,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FRAMESHIFT IN POSITION 653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CAUTION: REF.3 SEQUENCE DIFFERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUBCELLULAR LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ISP42 AND MOM38.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (Potential).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SWISS-PROT entry is copyright. It is produced through en the Swiss Institute of Bioinformatics and the EN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complete genome sequence complete genome sequence 277:1453-1474(1997).
                                                                                                                                                                                                   EG11780; ydek.
PS00013; PROKAR_LIPOPROTEIN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Biophys.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Proteobacteria;
                     884
1317
1325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         M N.A.
MG1655;
                                                                                         19
19
884
1317
5 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Acta 1153:345-347(1993)
                                                                                       18
1325
19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PubMed=9097039;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E.COLI YFAL.
ME, TO FUNGAL MITOCHONDRIAL
                       136514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Created)
                                                                                                                                                                                                                                                                   ALT_INIT.
ALT_INIT.
ALT_FRAME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Attached
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gamma
                  POTENTIAL.

HYPOTHETICAL LIPOPROTEIN YDEK.

N-ACYL DIGLYCERIDE (POTENTIAL).

N-> K (IN REF. 3).

M-> S (IN REF. 3).

MW; 26A3A066FA19AD7D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       precursor (ORFT).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Escherichia coli K-12.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FROM
                                                                                                                                                                                                        ب
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              update)
                                                                                                                                                                                                                                                                                                                                                                                                         (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         THAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        membrane
                                                                                                                                                                              Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SHOWN DUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IMPORT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        þу
                                                                                                                                                                                                                                                                                                                                                                                                                              by and for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ıs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Saito
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          anchor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N. J. ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                      00
00
                                                                                                                                                                                                                                                                                                                                                                                                                                                   its
way
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                      Q53047;
Q53047;
Q63047;
Q75000 (Rel. 39, Created)
Q75047;
Q75000 (Rel. 39, Last sequence update)
Q75001 (Rel. 40, Last annotation update)
Q75001 (Rel. 39, Created)
Q75001 (Rel. 39, Created
Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hacks
"The 120 kilodalton outer membrane protein (TOMp B) of ir
rickettsii is encoded by an unusually long open reading
evidence for protein processing from a large precursor.'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RICRI
                                                                                           MEDLINE=92167802; PubMed-1724278;
                                                                                                                                                                                                                           Bacteria; Proteobacteria; alpha subdivision; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OMPB_RICRI
                                                                                                                             STRAIN-R;
                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                   NCBI_TaxID=783;
                                                                                                                                                                                                                                                                               Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VNVSNGATLNSTGYGFIGGNASGKGIVNISTDSLWNLK-TSSTNAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IGVAGVGNLNISDGG--KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNFGSGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLP--GKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LGTNLGYDGHGEMNISNQGLVVSNGGSSLGYG----ETGVGNVSITTGGMWEVNKNVYTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD-NKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FLGTGEAFRYIYIGDAGDGELNVSSEGKVDSGIITAG---MKETGTGNITVKDKNSVITN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -DQDSVITVRRLYNGYFGNG---TVNISNNGLINNKEYSLVGVQDGSHGVVNVTDKGHWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALN--VNQLQNSGWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EKGGEWLIKNNDSSIEFQIGNQGTGEATIREGGLVTAENTIIGGNATG:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EKDGK-LYTGKDKG------ENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTE-----VKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VLGGTWRLYDSGNNARPLNVGQSGTGTLNIKQKGHVDG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GIGST--LTDT-----LLNTG----ATTNYTNDNYTDDEKKRAASVKDVLNAGWNIKGVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --TNIDTDVAYDAYLVGWYGTGVLNILAGGN-ASLTTITTSV-----IGANEDSEGTVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNRIYRVIWNCTLQVFQACSELTRRAGKTSTVNLRKSSGLTTKFSRL-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    147;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GTVNVEGEDSVLTTELFEIGSYGTGSLNIT----DKGYVTSSIVAILGYQAGSNGQVVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                               rickettsii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -TLGVLLALS---GSASGASLEVDNDQI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.9%;
22.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DSKAVAGSSGKVISGNVSPSKGKMDET---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -GYSSISDGGNWIIKGTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         206;
No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0052
                                                                                                                                                                                                                                                     Rickettsiales
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                 Hackstadt T.;
) of Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---- IGTLNVQ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -VIIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               54 C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    27;
```

```
SOFTTTTT
 밁
                              δÃ
                                                                      Дď
                                                                                                     ρy
                                                                                                                                             В
                                                                                                                                                                              Оy
                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mol. Microbi [2] SEQUENCE OF STRAIN=R;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=90136087; PubMed=2515418; Gilmore R.D. Jr., Joste N., McDonald G.A.; Cloning, expression and sequence analysis of the gene encoding 120 kD surface-exposed protein of Rickettsia rickettsii."; Mol. Microbiol. 3:1579-1586(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Antigen;
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MOL. Microbiol. 3:1579-1586(1989).

-!- FUNCTION: THE 120 kDa SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.
-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DOMAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                use by non-profit institutions as long a modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the European Bioinformatics Institute. There are no restrictions on use by non-profit institutions as long as its content is in no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; X16353; CAA34403.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro; IPR003858; rOmpA_rOmpB
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                               413
528 GNAGGAAALQRITLANDAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTSTQNNIVVDFD
                                                                                                                                                                                   315
                                                                                                                                                                                                                      357
                                                                                                                                                                                                                                                                                                                                                                                                            171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       149
                                    410
                                                                                                             357
                                                                                                                                                                                                                                                            281
                                                                                                                                                                                                                                                                                                                                                                       259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  113
                                                                                                                                                                                                                                                                                               302
                                                                                                                                                                                                                                                                                                                                   231
                                                                                                                                                                                                                                                                                                                                                                                                                                                201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Microbiol. 5:2361-2370(1991).
                                                                                                                                                                                                                                                                                                                                                                       --GGTTINFTGTDGTGRLVLLSKHAA--ATNFNITG------SLGGNLKGVIE 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KNAQNV-----VVQFNNGAAIDNNDLKGVG---RIDFGAPASTLVFNLANPTTQKAPLIL 200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LLLNTANNLAVTVSEDTTLGFITNVVHNAHSFNLTLNAG---KTLTITGQGVTNAQAAAT 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IIWNSALNAWVVVSELTR------NHTKRASATVKTAVLATLLFATVQASAN 52
                                                                                                                                             NAITLTGNFTGDASNPGNTAG--VITFDANGTLESASADANVAVTNNITAIEASGAGVVQ 470
                                                                                                                                                                                 DAV------NKAGWRMKTTTANG--QTGQADKFETVTSGTNVTFASGKGT-- 356
                                                                                                                                                                                                                                                                                                                         GTTASDNVDFVRTYDTVEFLSADTKTTTVN------VESKDNGKKTEV--KIGAKTSV 280
                                                                                                                                                                                                                                                                                                                                                                                                          TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NEEQEEDLYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKA 112
                                                                                                                                                                                                                      IQSAN---ATGQVNFRHIVDVGADGTTAFKTAASKVTITQDSNFGNTDFG-NLAAQIKVP 412
                                                                                                                                                                                                                                                          IKEKDGKLVTGK-----DKGENGS-----
                                                                                                                                                                                                                                                                                               FNTVA----VDGQLTANAGAANAVIGTNNGAGRAAGFVVSVDNGKVATIDGQVYAKDMV
                                                                                                                                                                                                                                                                                                                                                                                                                                              GDNAVI-ANGVNGTLNVTNGFIQVSNKSFATVKAINIADGQGIIFNTDANNANTLNLQA- 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDNLKIKONGTNFTYSLKKDLTDLT--SVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                      LSGTHAAELRLGNAGSIFKLAD----GTVINGKVNQTALVGGALAAGTITLDGSATITGDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 s-layer;
                                                                                                       --TATVSKDDQGNITVMYDVNVGDALN--VNQLQNSGWNLDSKAVAGSSGKVISGNV 409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 1333 120 KDA SURFACE-EXPOSED PROTEIN.
1334 1654 32 KDA BETA PEPTIDE.
1181 1188 POLY-THR.
1654 AA; 168184 MW; D7AB70FB7087F618 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Cell wall.
1333
1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6.7%; Score 201; DB 1; Length 1654; 22.6%; Pred. No. 0.012; tive 83; Mismatches 282; Indels 19
                                      ----STDEGEGLVTAKEVI 314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels 196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     and for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ВУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  in no way
c commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the
   587
                                                                                                                                                                                                                                                                                               356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        33;
```

4
Query Match Best Local Similarity 21.8%; Pred. No. 0.033; Matches 151; Conservative 87; Mismatches 239; Qy 24 RNHTKRASATYKTAVLATLLFATYQASANNEEQ
EMBL; M22618; AAA50323.1; PIR; A28182; A28182. Hemolysis; Toxin; Outer membrane; Sigranal 1 30 CHAIN 1 1608 HEMOLYSII SEQUENCE 1608 AA; 165078 MW; D6691
his SWISS-PROT entry is copyright.  Detween the Swiss Institute of Bioi  He European Bioinformatics Institut  See by non-profit institutions as  codified and this statement is not r  notities requires a license agreemen  notities requires a license agreemen
J. Bacteriol. 170:3177-3188 -i- FUNCTION: BACTERIAL HEMM CELL MEMBRANES AND CAUSI DEFINED.
- z (o m (o i
01-AP 01-NO 01-NO Hemol
SUL YA_
Db 762 ENTVA 766
Qy 581 FGASA 585
QY 535 LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGH ::: :
Qy 484 VAPGVKEGDVTINVAQLKGVAQNLNIRIDNVDGNARAGIAQAIATAGLVQAY :
Qy 439 IATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITN

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
 RESULT 8
                                                                                                                                                                                                                                                                                             οy
                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                            01-APR-1990 (Rel. 14, Created)
01-APR-1990 (Rel. 14, Last sequence up
16-OCT-2001 (Rel. 40, Last annotation
                                                                                                                                                                                                                        OMPA_RICRI
P15921;
                                                                                                                                                                                                                                                                             1035
 This
                                                                                                                                                                            Outer membrane protein A precursor antigen) (rOmpA) (rOmp A).
                                 STRAIN-R
                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                  Rickettsiaceae;
NCBI_TaxID=783;
                                                                                                                                                    Bacteria;
                                                                                                                                                             Rickettsia rickettsii
                                                                                               MEDLINE=90354033; PubMed=2117568;
                                                                                                                                                                                                                                                                                               561
                                                                                                                                                                                                                                                                                                                                                                                     875
                                                                                                                                                                                                                                                                                                                                                                                                     417
                                                                                                                                                                                                                                                                                                                                                                                                                       819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              645
                                                                                                                                                                                                                                                                                                                 983
                                                                                                                                                                                                                                                                                                                                                  924
                                                                                                                                                                                                                                                                                                                                                                   465
                                                                                                                                                                                                                                                                                                                                                                                                                                        363
                                                                                                                                                                                                                                                                                                                                                                                                                                                         763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      520
                 SIMILARITY: BELONGS
SWISS-PROT entry is copyright.
                                                                                                                                                                                                                                                                             SIDAANGINVNVKKDAIYQGTALNGGRGKTAVNA 1068
                                                                                                                                                                                                                                                                                                                                                                   GDALNVGSKK--DNKPVRITNVAPGV----KEGDV----TNVAQLKGVAQNLN------
                                                                                                                                                                                                                                                                                                                                                                                     DVGVNI---
                                                                                                                                                                                                                                                                                                                                                                                                    DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VTAKEV--IDAVNKAGWRMKTTTANG---QTGQADKFETVTSGTNVTFASGKGTTATVSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GDKQYRAGLRIEHTRDSEKTTRTENSA--SSLSGGSVKLKAEKDVTFSGSKLVADKGDAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TNLTLVSHKDADVIGSQVASGGELSVESKTGNINVKAAERQQNIDEQKTALTVNGYAKEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTAS
                                                                                                                                                                                                                                                                                                                               --- NRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIG---- GGTYRGEAGYAIGYSS
                                                                                                                                                                                                                                                                                                                                                  IGAQGGSSEKRSSSSQAVVSSVQAGSIDINAKGEVRDQGTQYQASKG-AVNLTADSHRSE
                                                                                                                                                                                                                                                                                                                                                                                                                                      -----DDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                         VSGNKVSFLAADDKTASNTEQTKIGGGFYYTGGIDK---LGSGVEAGYENNK-TQAQSSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ------SKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS--TDEGEGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RID-NALSTTVDKIDARTGTAFNITSSSHKADNSYQSSTASEL-----KSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NNSN-----RREISHASELTSGGTLRL----NGQQGVTITGSKARGQKGGEVTA-THGGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NGTNFTYSLKKDL---TDLTSVGTEKLSFSANGNK-VNIT-SDTKGLNFAKETAGTNGDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IQVGVQKTANAKAVRDDKTSWG----
                           GLYCOSYLATED
                                                                                                                                                    Proteobacteria;
                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                          obacteria; alpha subdivision;
Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                             ----IIKGTASGNSRGHFGASA 585
                                                                                                                                                                                                                                                                                                                                                                                                                     - INARDKLTQQGAQHSVGGAYQENAAGVDHLAAADTASTTTTKT
                                                                                                                                                                                                                                                                                                                                                                                   -GANVDYSAVTRPVERAVGKAAKLDATGVINDIGGIGAPNVGLD
                           (PROBABLE
                 TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                -GSAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ·LSADTKTTTVNVE-------
                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                               -VRVYTTTGSDLTVDAKGEGGTQRSNSSASQAVTG
                                                                                                                                                                               e update)
יח update)
יוס kDa
 Ιt
                                                                                                                                                                                                                                2249
is produced
                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     : ||| :
                                            BACTERIUM
                                                                              egnery R.L.;
rickettsii has
                                                                                                                                                                                      antigen)
                                                                                                                                                   Rickettsiales
through a
                                           SI
                                                                                                                                                                                       (Cell surface
                                                                                                                                                                                                                                                                                                                                                                                                     -GADAPTLSVD
                                            COVERED
                                                                              tandemly
collaboration
                                            ВY
                                                                                                                                                                                                                                                                                                                                                                                                    464
                                                                                                                                                                                                                                                                                                                                                                                                                                       416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     175
                                                                                                                                                                                                                                                                                                                                560
                                                                                                                                                                                                                                                                                                                                                                                                                      874
                                                                                                                                                                                                                                                                                                                                                                                                                                                         818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                644
                                                                                                                                                                                                                                                                                                                                                                   507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               262
                                                                                                                                                            Вþ
                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                    Ω
                                                                                                                                                                                                                                                                                                      밁
ρ
                 밁
                                  Ş
                                                    밁
                                                                    δã
                                                                                      밁
                                                                                                       Ş
                                                                                                                          밁
                                                                                                                                        Qy
                                                                                                                                                                           δÃ
                                                                                                                                                                                               밁
                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Antigen;
SIGNAL
                  1174
                                                                                       1074
                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CHAIN
DOMAIN
                                                                                                                          1021
                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                      REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
                                   527
                                                                       472
                                                                                                                                                                                                                                                                                                                                                                                                                               (EPEAT
 563
                                                                                                                                           359
                                                                                                                                                             969
                                                                                                                                                                             299
                                                                                                                                                                                               935
                                                                                                                                                                                                                239
                                                                                                                                                                                                                                                   194
                                                                                                                                                                                                                                                                    820
                                                                                                                                                                                                                                                                                      151
                                                                                                                                                                                                                                                                                                      766
                                                                                                                                                                                                                                                                                                                       86
                                                                                                                                                                                                                                                                                                                                                 Similarity
```

1;

Length 2249;

```
between the Swiss Institute of Bioinformatics and the EMBL outst
the European Bioinformatics Institute. There are no restrictions
use by non-profit institutions as long as its content is in
modified and this statement is not removed. Usage by and for con
                                                                                                                                                                                                                                                                  entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                            Pfam; PF02708;
                                                                                                                                                                                                                                  EMBL; M31227;
PIR; A41477; I
                                                                                                                                                                                                                        interPro; IPR003858; rOmpA_rOmpB
                                                                                                                                                                                                 Repeat;
                                800
875
950
1022
                                                                                                                        212
212
287
287
359
431
                                                                                                                                                                                                                                              AAA26380.1; -.
                                                                                                                                                                                                              rOmpA_rOmpB;
  ۸Ą,
                                                                                                                                                                                                 Signal;
            286
430
505
577
652
724
799
874
1021
11093
  224333
                                                                                                                                                                                                  Cell
  MW;
            TYPE TYPE
                                           X L H H G T E D C B A
                                                                                                                                                                 OUTER MEMBRANE PROTEIN
13 X APPROXIMATE TANDEM
                                                                                                                                                                                        POTENTIAL.
                                                                                                                                                                                                  wall;
                      (TYPE I)
(TYPE II)
                                                                 (TYPE
3 I (INCOMPLETE).
A9D6646C089DF087
                                                                                                                                                                                                  S-layer;
                                                                                                                                                                                                                                                                           moved. Usage by and for commercial (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                  Glycoprotein
                                                                                                                                                                  TANDEM REPEATS
   CRC64;
                                                                                                                                                                              ×
                                                                                                                                                                                                                                                                                                                         EMBL outstation
                                                                                                                                                                                                                                                                                      in no way
                                                                                                                                                                                                                                                                                                   n 0
```

```
NEKGYLTAREITLKAGDNLKIKQNGTNFTYSLKK----DLTDLTSYGTEKLSFSAN-----G
                                                                                                                                                                                                                                                                                                                                 NV-----GNTNALATVNYGAGL---LQVQGGVVKANTINLTDNASAVTFTNPVVVTGAIDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAVIKATTTKLTNAASVLTLTNANAVLTGAVDNTTGGDNVGVLNLNGALSQVTGDIGNTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NKVNITSDTKGLNFAKETAGTN-----
DGGNW11K---
                                          TVNVGAGITLQA----GGSLAANNIDFGARSTLEFNGPLDGG------GKAIPYYFKGAIA
                                                                                                                                          NLTDNASAVTFTN--PVVVTGAIDNTG-----NANNGIVTFTGNSTVTGDIGNTNALA
                                                                                                                                                                                    SKKDN-KPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARA---
                                                                                                                                                                                                                                      TGNANNGIVTFTGNSTVTGNVGN
                                                                                                                                                                                                                                                                                  TVNINAG-----NNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDAL--NVG
                                                                                                                                                                                                                                                                                                                                                                              TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNYTFASGKGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVLNLNGALSQVTGDIGNT-----NSLAT-ISVGAGTATL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEVRTYDTVEELSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SLATISYGAGTATLGGAVIKATTTKLTN-----AASVLTLTNANAVLTGAIDNTTGGDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NANAVLTGAIDNTTGGDNVGV----LNLNGALSQVTGDIGNTNSLAT--ISVGAGTATLG
                                                                                         -AGL-VQAYLPGKSMMA--
                                                                                                                                                                                                                                                                                                                                                                                                                               ·GGAVIKATTTKLTDAASAVKFTNPVVVTGAIDNTGNANNGI-VTFTGNSTVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6.48;
-GTASGNSRGH---FGASASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 191; DB 1
Pred. No. 0.052;
6; Mismatches 2
                                                                                                                                                                                                                                   TNALATVNVGAG----LLQVQGGVVKANTI 1122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -GDT--TVHLNGIGSTLTDTLLNT- 193
                                                                                         -IGGGTYRGEAGYAIGY---SSIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            212;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            172;
                                                                                                                                                                                       -GIAQAIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                          1173
                                                                                                                                                                                                                                                                                                                                    1073
                                                                                                                                                                                                                                                                                                                                                                                                                               1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               150
                                                                                           562
                                                                                                                                                                                                                                                                                     471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            30;
```

```
RESULT 9
BIGA_SALTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        용
                                                                                                                              EMBL; AE008859; AAL22340.1;
EMBL; M64606; AAA27043.1; I
EMBL; M64606; AAA27043.1; I
PIR; C39200; C39200.
PIR; D39200; D39200.
         REPEAT
REPEAT
REPEAT
REPEAT
                                                     DOMAIN
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1225
                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a celebrate the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and fo
                                                                                                                                                                                                                                                                                                                                                                                                                                                     McClelland M., Sanderson K.E., Spieth J., Cliftor Courtney L., Porwollik S., Ali J., Dante M., Du I Leonard S., Nguyen C., Scott K., Holmes A., Grewa Ryan E., Sun H., Florea L., Miller W., Stoneking Waterston R., Wilson R.K.;
                                                                                      CHAIN
                                                                                                            Virulence;
                                                                                                                       StyGene;
                                                                                                                                                                                                            or send
                                                                                                                                                                                                                                                                                                                                        MEDLINE-91100301; PubMed-1987123;
Wu J.Y., Siegel L.M., Kredich N.M.;
"High-level expression of Escherichia
requirement for a cloned cysG plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Stojiljkovic I., Valenti
"Salmonella typhimurium
Submitted (MAR-1999) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P25927; P25928; Q9XCQ3;

01-MAY-1992 (Rel. 22, Created)

01-MAR-2002 (Rel. 41, Last sequence update)

01-MAR-2002 (Rel. 41, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BIGA_SALTY
 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                           Nature 413:852-856(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                 "Complete genome LT2.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-LT2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-14028;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; Salmonella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Putative surface-exposed virulence BIGA OR STM3478.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-LT2 / SGSC1412 / ATCC 700720;
MEDLINE-21534948; PubMed-11677609;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Salmonella typhimurium
                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=602;
                                                                                                                                                                                                                                                                                                                       Bacteriol.
                                                                                                                                                                                                                                                                                                  'n
                                                                                                                                                                                                                                                                                                             CAUTION: Ref.3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AF133696; AAD39458.1;
                                                                                                                                                                                                                                                                                         positions 414 and 732.
                                                                                                                                                                                                             an
                                                                                              SG10437; bigA.
e; Repeat; Signal;
                                                                                                                                                                                                                        requires a
                                                                                                                                                                                                                                                                                                                                                                                                  OF.
                                                                                                                                                                                                           equires a license agreement (See http://www.isb-sib.ch/announce/email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                 1-765
  101
101
104
114
123
134
                                                                                                                                                                                                                                                                                                                      173:325-333(1991)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                            AAL22340.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                           sequence of Salmonella enterica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Valentine
                                                                                      1953
                                                                                                                                                                                                                                                                                                                                                                                                 FROM N.A.
  252
103
113
122
133
144
155
                                                                                                                                                                                                                                                                                                            sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ine P., Heffron F.;
rhs homolog.";
the EMBL/GenBank/DDBJ
                                                                                                                                                      ALT_FRAME.
ALT_FRAME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gamma
                                                                                                           Complete
                                                                                                                                                                                                                                                                                                            differs
55 to 20 to
                                                              PUTATIVE SURFACE-EXPOSED VIRULENCE PROTEIN BIGA.
15 X 11 AA TANDEM REPEATS.
                              1 (INCOMPLETE).
2 (INCOMPLETE).
3 (INCOMPLETE).
                                                                                                POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ion update)
protein bigA precursor
                                                                                                           proteome.
                                                                                                                                                                                                                                                                                                          from
                                                                                                                                                                                                                                                                                                                                         coli NADPH-sulfite reductase:
to overcome limiting siroheme
                                                                                                                                                                                                                                                     There are no restrictions
                                                                                                                                                                                                                                                                                                            that
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Clifton S.
M., Du F.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Grewal N., Mu
eking T., Nhan
                                                                                                                                                                                                                                                                                                          shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1266
                                                                                                                                                                                                                                                                                                                                                                                                                                          serovar Typhimurium
                                                                                                                                                                                                                                                                                                            due
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hou
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Σ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mulvaney
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Latreille E
S., Layman
                                                                                                                                                                                                                                                                                                            ξ
                                                                                                                                                                                                                            is
for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .
                                                                                                                                                                                                                                                                             a collaboration
                                                                                                                                                                                                                                                                                                            frameshifts
                                                                                                                                                                                                                                                                   outstation
                                                                                                                                                                                                                                   commerci
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ئ
تار
                                                                                                                                                                                                                                             no
                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      D.
                                                                                                                                                                                                                                 way
cial
```

```
RESULT 10.

OMPB_RICCN

ID OMPB_RICCN

AC O9KKA3; O9KK98; O9XC45;

DT 16-OCT-2001 (Rel. 40, Created)

DT 01-MAR-2002 (Rel. 41, Last sequence update)

DT 01-MAR-2002 (Rel. 41, Last annotation update)

DE Outer membrane protein B precursor (168 kba surface-layer protein)

DE (Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)

DE (rOmp B) [Contains: 120 kba surface-exposed protein (Surface protein antigen) (120 kba outer membrane protein ompB); 32 kba beta peptide].
                                               OMPB
ID
AC
DT
DT
DT
DE
DE
DE
                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                             δã
                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             113
                                                                                                                                                                                                                                                                                   537
                                                                                                                                                                                                                                                                                                           776
                                                                                                                                                                                                                                                                                                                                   495
                                                                                                                                                                                                                                                                                                                                                           726
                                                                                                                                                                                                                                                                                                                                                                                                                                 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                        610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       447
                                                                                                                                                                                                            895 TRASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
hes 126; Conserv
                                                                                                                                                                                                                                  SASVG
                                                                                                                                                                                                                                                          TYNALLMADGEGTSIENKGDITSHGVYSVIRADNGSEVSNSGDILVYATSSNSSEDRAAI
                                                                                                                                                                                                                                                                                   --GKSMMAIGGGTYRGEAG-----YAI----GYSSISDGGNWIIKGTASGNSRGHFGA
                                                                                                                                                                                                                                                                                                           GISVSGNSTVTLNGH
                                                                                                                                                                                                                                                                                                                                                           DDNDLSATGGQYLDVVGLSVTGDDNDVEIDG-GINITHSED--PLDGTS-----ADIT
                                                                                                                                                                                                                                                                                                                                                                                                         FSSATGVSVSGDSNAVDITGNVNISADYGQDDLAAGAPPLTGVVVGGNGNTVTLNGALNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VIKEKDGKLYTGKDKGENGSSTDEGEGLYT--AKEVI--DAVNKAGWRMKTTTANGQTGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDMTITDGGTGGHITGDNVVIDNAGSTTVSGADATALYIEGDNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GDTTVHLNGIGSTLT-DTLL--NTGATT-----NVTNDNVTDDEKKRAASVKDVLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDNATIKNTGTS-----DISGAGSTGT-----VIDGNNARVNND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                  NVAQLKGVAQNLNNRIDNVDGNARAG----IAQAIATAGLV----
                                                                                                                                                                                                                                                                                                                                                                                 ---DIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVT
                                                                                                                                                                                                                                                                                                                                                                                                                                GWNLDSKAVAGSSGKV-ISGNVSPS-----KGKMDETVNINAGNNIEITRNGK-NI
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADSVGFVVAGEKNTFKNKGDIDVSLNGTGALVS-GDMSQVTLDGDINV----VSVQDSEGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ADKFETVTSGTNVTF-----ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EGNOTISGGAVGTRIDGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AG-WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTS
                                                                                                                                                                                                            899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   189
200
211
221
222
233
244
207
514
1698
1795
1836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----NGDNGSLTQAGDLLVTDGAMGIITYGTGNEA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             166
177
188
199
210
221
232
243
252
243
252
267
207
514
1698
1798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6.3%;
                                                                                                                                                                                                                                                                                                           -STIDTNTVVGGHVVLARVNNGGSLILGDDSVVDVNVSYIPTGYY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  200150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7.
8.
9.
9.
10.
11.
11.
12.
13.
14.
15 (INCOMPLETE).
1 -> DRGDDDVTPPDD (I REF. 3).
D -> N (IN REF. 3).
D -> N (IN REF. 1).
OYLE -> ITLO (IN REF. SA -> T (IN REF. 1).
0 MW; 611B3F1C954D91Ai
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 189.5; DB 1;
Pred. No. 0.052;
4; Mismatches 194;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   611B3F1C954D91AE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -> ITLQ (IN REF. > T (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---DAHTTNTGDIAVDGAGSAAVII-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 1953;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---KNTGNATVRD
                                                                                                                                                                                                                                                                                                                                   -QAYLP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NIA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       161;
                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                           834
                                                                                                                                                                                                                                                                                                                                                                                 494
                                                                                                                                                                                                                                                                                                                                                                                                                                 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                         665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               220
                                                                                                                                                                                                                                                                                                                                   536
                                                                                                                                                                                                                                                                                                                                                                                                         725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       29;
```

Rickettsiaceae;

Rickettsieae;

alpha subdivision; eae; Rickettsia.

Rickettsiales;

Best Loc Matches

Local Similarity 21.

21.6%;

Pred. No. 0.007; Mismatches

.06;

266;

Indels

241;

Gaps

36;

Bacteria; Proteobacteria;

Rickettsia

conorii.

OR.

RC1085

```
VARIANT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                      VARIANT
VARIANT
VARIANT
VARIANT
                                                                                                               VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                       "The rickettsial outer membrane protein A and B genes of Ricke australis, the most divergent rickettsia of the spotted fever Submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: THE 120 KDA SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION (BY
                                                                                                                                                                                              EMBL;
EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 33-1649 FROM N.A. STRAIN=Indian tick typhus, and Malish MEDLINE=20393643; PubMed=10939649;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ogata H., Audic S., Samson D., Roux V., Raoult D.,
                                                                                                                                             CHAIN
                                                                                                                                                                           Pfam;
                                                                                                                                                                                                                                                or send an
                                                                                                                                                                                                                                                                 use by non-profit institutions as long modified and this statement is not removed
                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                             This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Phylogenetic analysis of members of the genus Rickettsia gene coding the outer-membrane protein rOmpB (ompB)."; Int. J. Syst. Evol. Microbiol. 50:1449-1455(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=21442074; PubMed=11557893;
Ogata H., Audic S., Renesto-Audiffren P., Fournier P.-E.,
Samson D., Roux V., Cossart P., Weissenbach J., Claverie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A. STRAIN-Malish 7;
                                                                                                                                   VARIANT
                                                                                                                                                        CHAIN
                                                                                                                                                                 Antigen;
                                                                                                                                                                                     InterPro;
                                                                                                                                                                                                                                                          entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Stenos
                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 353-1655 FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Roux
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Mechanisms of evolution in Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                             SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVER LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY).
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                      European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                     FUNCTION: THE 32 KDA BETA PEPTIDE MAY
                                                                                                                                                                                                                                                                                                                                                             (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                 SIMILARITY)
                                                                                                                                                                                                                                                                                                           SWISS-PROT entry is copyright.
                                                                                                                                                                                            AE008659; AAL03623.1; -. AF123721; AAF34124.1; -. AF123726; AAF34129.1; -. AF149110; AAD39533.1; -.
                                                                                                                                                                          PF02708;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Raoult D
                                                                                                                                                               s-layer;
                                                                                                                                                                                                                                                                                               the Swiss Institute of Bioinformatics
                                                                                                                                                                                   IPR003858; rOmpA_rOmpB.
                                                                                                                                             1335
                                                                                                                                                                                                                                               email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Walker D.;
                      251
413
959
988
1139
1139
1159
1159
                                                                                                                                                                          rOmpA_rOmpB;
  AA;
                                                  1655
61
75
78
251
413
959
988
1139
   168342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N.A.
 Rickettsia
                                                                                                                                                                 Complete
                                               · , ,
                                        ť
-> S (IN REF. 3).
-> D (IN REF. 3).
-> S (IN REF. 3).
-> R (IN REF. 3).
-> R (IN REF. 3).
                                                                                                                                            KDA BETA PEPTIDE
                                                                                                                                                      KDA
                                                                                                                        s »
                                                A (IN STRAIN
S (IN STRAIN
N (IN STRAIN
A (IN STRAIN
O (IN STRAIN
V (IN STRAIN
T (IN STRAIN
L (IN STRAIN
C (IN STRAIN
L (IN STRAIN
N (IN REF.
                                                            ٢
                                                                                                                                                                                                                                                                                                  It is produced through a collaboration informatics and the EMBL outstation -
                                                                                                                                                     e proteome.
SURFACE-EXPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7;
                                                                                                                                                                                                                                                        (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                          There are pong as its o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       conorii and
                                                                                                                                                                                                                                                                                                                                                                      SERVE AS
                                                                                                                                                                                                                                                                 Usage
                                                                                                  INDIAN
INDIAN
INDIAN
                                                 INDIAN
3).
                                                                      INDIAN
INDIAN
                                                                                                                                                                                                                                                                                                and the
                                                                                                                                                                                                                                                                                                                                                                                                                               genes of Rickettsia spotted fever group
                                                                                                                                                                                                                                                                                       ņ
                                                                                                                                                                                                                                                                              content
  CRC64;
                                                                                                                                                                                                                                                                                                                                                                      A MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ₽.
                                                                                                                                                                                                                                                                   уd
                                                                                                                                                      PROTEIN.
                                                            restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       prowazekii.";
                                                                                                                                                                                                                                                                                                                                                  COVERED
                                                                                                                                                                                                                                                                   and
                                                                                                                                                                                                                                                                                                 EMBL
                                                           X TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Barbe
                                                                                                                                                                                                                                                                                                 outstation
                                                                                                                                                                                                                                                                                                                                                                      ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                 group.";
                                                                                                                                                                                                                                                                                                                                                  ВУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .
۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                                                                                                  Þ
                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                       on
```

Query Match

6 28

Score

186.5;

DВ

1;

Length 1655;

```
RESULT
OMPB_RI
밁
                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                  ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                              p96989;
15-JUL-1998 (Rel. 36, Createu,
15-JUL-1998 (Rel. 36, Last sequence update,
15-JUL-1998 (Rel. 36, Last sequence update,
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rompB)
(Surface protein antigen) (Cell surface-exposed protein (Surface protein)
antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptic
                                                                                                                                                                                                                                 RICTY
                            Bacteria; Proteobacteria; alpha subdivision; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                               OMPB_RICTY
                                                                                                                                                                                                                                                                                            743
                                                                                                                                                                                                                                                                                                                         561
                                                                                                                                                                                                                                                                                                                                                         687
                                                                                                                                                                                                                                                                                                                                                                                      516
                                                                                                                                                                                                                                                                                                                                                                                                                    627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               155
                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10
                                                                                                                                                                                                                                                                                                                         ISDGGNWIIKGTASGNSRGHFGASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GNNIEITRNGKNI----DIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSVFKLADGTVINGKVNQTALVGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                          FNAGGTNIVSGTVGGQQGNKFNTVA
                                                                                                                                                                                                                                                                                                                                                         TLATGTNLGSATNPLAEINFGSKGAANVDTVLNVG----KGVNLYATNITTTDANVGSFI
                                                                                                                                                                                                                                                                                                                                                                                    NARAGIAQAIATAGLVQAYLPGK---
                                                                                                                                                                                                                                                                                                                                                                                                                  QFNIGSSKTVLSDGDVAINELVIGNNGAVQFAHNTYLITRTTNAAGQGKIIFNPVVNNNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                  ITNVAPG - - - VKEGDV - - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGTIKLTSTQNNIVVDFDLAIA-TDQTGVVDASSLTNAQTLTINGKIGTVGA--NNKTLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LAAGTITLDGSATITGDIGNAGGAAALQGITLANDATKTLTLGGANIIGANGGTINFQAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VNVGDALNVNQLQNSGWNLDSKA-----VAGS-----SGKVISGNVSPSK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DKG----ENGS-STDEGE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -VNGANGTLNVTNGFIKVSS-----KSF-ATVNVINI-GDGQGIMFNTDADNVNTLNLQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NTANNLDVTVREDTTLGFITNVVNNANHFNLMLNAGKTLTITGQGITNVQAAATKNANNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NSALNAWVVVSELT - - - - - - - - - RNHTKRASATVKTAVLATLLFATVQASANNEEQEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ITQNSNFGTTD-FGNLAAQIIVPNTMTLNGNFTGDASNPGNTAGVITFDANGTLASASAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAGFVVSVDNGKVATIDGQVYAKDMVIQSANAVGQVNFRHIVDVGTDGTTAFKTAASKVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----GANAAVIGTNNG---AGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NGATITFNGTDGTGRLYLLSKNAA--ATDFNVTG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----VAQVNNGAAIDNNDLQGVGRIDCGAAAS--TLVFNLANP-TTQKAPLILGDNAVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DLYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -TANGQTGQADKF-----
                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ETVTSGTNVT-FASGKGTTA-TVSKDDQGNI-TVMYD
                                                                                                                                                                                                                                                                                            767
                                                                                                                                                                                                                                                                                                                          585
                                                                                                                                                                                                                                                                                                                                                                                    SMMAIGGGTYRGEAGYA--
                                                                                                                                                                                                                 1645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -GLVTAKEVIDAVNKAGWRMKTT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                               -TNVAQLKGVAQNLNNRIDNVDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----SLGGNLKGI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -GKMDETVNINA-
                                                                                         peptide]
                                                                                                                                                                                                                                                                                                                                                                                      IGYSS
                                                                                                                                                                                                                                                                                                                                                                                                                    686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                172
```

```
ρy
                                                                                                                         В
                                                                                                                                                     Qy
                                                                                                                                                                                                                  Š
Дb
                           20
                                                             밁
                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN-WILMINGTON;
STRAIN-WILMINGTON;
MEDILINE-94040787; PubMed-8224886;
MEDILINE-94040787; PubMed-8224886;
MEDINING and Sequence analysis of the gene e "Cloning and sequence analysis of the gene e surface layer protein of Rickettsia typhi.";
Gene 133:129-133(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ching W.M., Carl M., Dasch G.A.; "Mapping of monoclonal antibody binding sites on CNBr fragments of the S-layer protein antigens of Rickettsia typhi and Rickettsia
                                                                                                                                                                                                                                                                                                                                                         TRANSMEM
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               between the Swiss Institute of Bioinformatics and the E the European Bioinformatics Institute. There are no rest use by non-profit institutions as long as its content modified and this statement is not removed. Usage by an entitles requires a license agreement (See http://www.isb-or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hackstadt T., Messer R., Cieplak W., Peacock M.G.; "Evidence for proteolytic cleavage of the 120-kilodalton membrane protein of rickettsiae: identification of an avimutant deficient in processing.";
                                                                                                                                                                                                                                                                                                                             CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=92104668; PubMed=1729180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=92114896; PubMed=1370573;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-WILMINGTON;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                         CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pfam; PF02708; rOmpA_rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro; IPR003858; rOmpA_rOmpB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IDENTIFICATION OF
                                                             160
 219
                              132
                                                                                                                         100
                                                                                                                                                                                     40
                                                                                          91
                                                                                                                                                      99
                                                                                                                                                                                                                    25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ect. Immun. 60:159-165(1992).

FUNCTION: THE 120 KDA SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.

FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S-LAYER WITH HEXAGONAL SYMMETRY.
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                    NHTKRASATV-----KTAVLATLLFAT---VQASANN-----EEQEEDLYLDPV--
 GFVKVSDKTFAGIKTINIGDNQGLMFNTTPDAANALNL
                                                                                            SDWAVYFNE-KGV
                                                                                                                           LAVTINENTTLGFVTNVTKQGNFFNFTIGAGKSLTITGHGITAQQAATTKSAQNVVSKVN
                                                                                                                                                                                     NRTTNAAATTYDGAGEDQTGAGVNLPVATNSVITANSNNAITENTPNGNLNSLELDTANT
                                                           AGAAINDNDLSGVGSIDFTAAPSVLEFNLINPTTQEAPLTLGDNAKI-VNGANGILNITN
                                                                                                                                                                                                                                                   164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    L04661; AAB48987.1; -
                              -DLTDLTSVGTEKLSFSAN-GNKVNITSD-TKGLNFAKETAGTNGDTTVHLNGIGSTL
                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                     S-layer;
                                                                                                                                                      --QRTVAVLIVNSDKEG-----
                                                                                                                                                                                                                                                                                                                             1354
1415
657
842
1071
1306
1645
                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             29:95-105(1992).
                                                                                                                                                                                                                                                                                                                           1353
1645
1429
657
842
1071
1306
AA; 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CLEAVAGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                        [ransmembrane;
                                                                                                                                                                                                                                                               6.2%;
                                                                                                                                                                                                                                                                                                                             169698
                                                                                                                                                                                                                                                                                                          32 KDA SURFACE-EXPUSEL FAVORED
32 KDA BETA PEPTIDE.
MEMBRANE ANCHOR (POTENTIAL).
H -> N (IN REF. 2).
V -> I (IN REF. 2).
G -> A (IN REF. 2).
G -> S (IN REF. 2).
G -> C (IN REF. 2).
G -> C (IN REF. 2).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SITE
                                                                                                                                                                                                                                                   81;
                                                                                                                                                                                                                                                 Score 185; DB Pred. No. 0.07 Nismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                      KDA SURFACE-EXPOSED PROTEIN
                                                                                          -LTAREITLKAGDNLKIKONGTNFTYSLKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             There are no restrictions
                                                                                                                                                         -TGEKEKVEE----
                                                                                                                                                                                                                                                                   .07;
                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   encoding
                                                                                                                                                                                                                                                                                ۲.
                                                                                                                                                                                                                                                   263;
                                                                                                                                                                                                                                                                                Length 1645;
 - QGGGNT I NFNGRDG - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IS COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    avirulent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    crystalline
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANCHOR.
                                                                                                                                                                                                                                                 Gaps
                                                                                                                            159
                                                                                                                                                         90
                                                                                                                                                                                        99
                                                                                                                                                                                                                     65
                                                                                                                                                                                                                                                    40;
```

```
RESULT Y741_CHLMU Y741_CHLMU TTF6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                     Chlamydia muridarum.
Bacteria; Chlamydiales; Chlamydiaceae; Chlamydia.
NCBI_TaxID-83560;
                                                                                                                              "Genome sequences of Chlamydia tracho pneumoniae AR39."; Nucleic Acids Res. 28:1397-1406(2000)
                                                                                                                                                   Gwinn M., Nelson W., DeBoy R., Kolonay J.,
Eisen J., Fraser C.M.;
"Genome sequences of Chlamydia trachomatis
                                                                                                                                                                                    Read T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg White O., Hickey E.K., Peterson J., Utterback T., Berry Linher K., Weidman J., Khouri H., Craven B., Bowman C.,
                                                                                                                                                                                                                        SEQUENCE FROM N.A. STRAIN=MOPn / Nigg; MEDLINE=20150255; F
                                                                                                                                                                                                                                                                                                           Hypothetical TC0741.
                                                                                                                                                                                                                                                                                                                                 16-OCT-2001
16-OCT-2001
                                                                                                                                                                                                                                                                                                                                                        16-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           271
                                                                                                                                                                                                                                                                                                                                                                                                                                         721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGV-KPGTTA------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ASSLTNNQTLTINGSIGTIGANTKTLGRFNVGSSKTILNAGDVAINELVMENDGSVHLTH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LANDASKILTLSGANIIGANAGGAIHFQANGGTIQLTSTQNNILVDFDLDVTTDQTGVVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NGNTAG--VITFNANGTLVSGNTDPNIVVTNIKAIEVEGAGIVQLSGIHGAELRLGNAGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     K---AGWRMKTTTANGQ--TGQADKFETVTS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DVGLGGKTN-FKTADSKVII----TENASFGSTDFGNLAVQIVVPNNKILTGNFIGDAKN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EVKIGAKTSVIKEKDGKLVTGKDKGENGS--STDEG------EGLVTAKEVIDAVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ANAVIGTONGAGRAAGFIVSVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGKLVLVSKNGNATEFNVTG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                IGGGTYRGEAGYA-----IGYSSISDGGNWIIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NTYLITKTINAANQGKIIVAADPINTDTALADGTNLGSAESPLSNIHFATKAANGDSILH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LGAGADAPTLSVDGD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IFKLADGTV-INGPVNQNPLVNNNALAAGSIQLDGSAII--TGDI--GNGAVNAALQDIT
                                                                                                                                                                                                                                                                                                                                                                                                                                          IG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -SDN-----VDFVRTYDTVEFLSADTKTTTVNVESKD------NGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                           KGVNLYANNITTTDANVGSLHFRSGGTSIVSGTVGG
                                                                                                                                                                                                                                                                                                                                 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                 40,
                                                                                                                                                                                                                         PubMed=10684935;
                                                                                                                                                                                                                                                                                                                    , Last :
, Last :
TC0741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VNINAGNNIEITRNGKNIDIATSM-----
                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----ALNVGSKK-----
                                                                                                                                                                                                                                                                                                                                sequence update) annotation updat
                                                                                                                                                                                                                                                                                                                    precursor
                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -- NGNAATISGQVYAKDIVIQSANAGGQVTFEHLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----SLGGNLKGVIEFDTTAAAGKLIANGGA
                                                                                                                                                                                                                                                                                                                                                                                 1007
                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                 Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -GTNVTFASG
                                                                                                                                                        MoPn
                                                                                                                                                                              McClarty
                                                                                                                                                                                                                                                                                                                                                                                                                                           758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 575
                                                                                                                                                        and
                                                                                                                                                                             G ()
                                                                                                                                                        Chlamydia
                                                                                                                                                                                                    X. F.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -DNKPVRIT-
                                                                                                                                                                              Salzberg
                                                                                                                                                                                           Dodson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -TPQFSSVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KGTTAT
                                                                                                                                                                                                     Bass
                                                                                                                                                                               S.L.,
                                                                                                                                                                                                   s.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    234
```

use by non-profit institutions as long modified and this statement is not removed. entitles requires a license agreement (See or send an email to license@isb-sib.ch).

the

between

s SWISS-PROT entry is copyright. It is produced through ween the Swiss Institute of Bioinformatics and the Eleuropean Bioinformatics Institute. There are no restricted to the control of the control of

There are no restrictions

EMBL

a collaboration
MBL outstation

outstation -tions on its in no way commercial

as its content . Usage by and for http://www.isb-sib

for

-

SIMILARITY: BELONGS TO THE CHLAMYDIAL

CPN0572/CT456/TC0741

```
RESULT 13
HXA3_HAEIN
ID HXA3_H
AC P45355
DT 01-NOV
DT 01-NOV
DT 16-OCT
DE Heme/h
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                       ДD
                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                οy
                                                                                                                                                      δ
                                                                                                                                                                                  밁
                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DR KW FT SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 156
          HXA3_HAEIN STAI
P45355;
01-NOV-1995 (Rel.
01-NOV-1995 (Rel.
16-OCT-2001 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CHAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL;
TIGR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hypothetical protein; SIGNAL 1 51
  Heme/hemopexin-binding
                                                                                                                                  876
                                                                                                                                                          575
                                                                                                                                                                                  827
                                                                                                                                                                                                                                                              487
                                                                                                                                                                                                                                                                                      711
                                                                                                                                                                                                                                                                                                               456
                                                                                                                                                                                                                                                                                                                                          655
                                                                                                                                                                                                                                                                                                                                                                                             909
                                                                                                                                                                                                                                                                                                                                                                                                                                                551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         285
                                                                                                                                                                                                                                     771
                                                                                                                                                                                                                                                                                                                                                                  406
                                                                                                                                                                                                                                                                                                                                                                                                                     355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   31
                                                                                                                                                                                                                                                                                                                                                                                                                GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVI
                                                                                                                                  LPRLRGH
                                                                                                                                                                                  ATPSTPLMTTPRTNGKAAASSLMIKGGETQA---
                                                                                                                                                                                                                                     GENGGSTERPLPAN - -
                                                                                                                                                                                                                                                            GVKEGDVTNVAQLKGVAQNLNNRIDNVDGNA-----RAGIAQAIATAGLVQAYLP
                                                                                                                                                                                                                                                                                                                                         TVYPGENGGSTEGPL - - PANQNLGNVIHDVEQNGAAQE - -TIITPGDTESTDTSSSVNAN
                                                                                                                                                                                                                                                                                                                                                                                             DTDSGIGDDD-
                                                                                                                                                                                                                                                                                                                                                                                                                                              GST---EGPLPANQNLGNVIHDVEQNGSAKETIITPGDTGPTDSSSSVDADADVEDTS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SSTDEGEGLVTAKE----VIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SLSDVDSRVEDDDGVSDTESTNGNDSGKTTSTEENGDPSGPDILAAVRKHLDTVYPGENG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KIGAKTSVIKEKDG----KLVTGKDK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DVLNAGWNIKGVKPGT-TASDNVDFVRTYDTVEFLSADTKT---TTVNVESKDNGKKTEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GDDGISFSNETIGSEPFATPPSSPSQTPVINVNVNVGGTNVNIGDTNVS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DTKGLNFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGAT-TNVTNDNVTDDEKKRAASVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KFRTCVAYGPWNPKENGPNYTPSAWRRGHRVDFGKIFDGT----APFNKINWGSSPTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ------KIKQNGTNFTYSL--KKDLTDLTSV--GTEKLSFSANGNKVN----ITS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TKEDLGLKD-LEDMCAKFCTGYNKFSSDWG---NRVDPLVSSKAGIESGGHLPSSVIINN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -KEGTGEKEKVEE------NSDWAVYFNEKGVLTAREITLKAGDNL-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SPTDKSSLLAFL--SNPNTKAKMLEHSGHLVFIDTTRSSFIFVPNGNWDQVCSMKVQNGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SATVKTAVLATLLFATVQASANNEEQEEDLYLDPVQRTVAVLIVNSD------
                                                                                                                                                                                                                                                                                    ADLEDVSDADSGFGDDDGISDTESTNGNDSGKNTPVGDGGTPSGPDILAAVRKHLDTVYP
                                                                                                                                                                                                                                                                                                                                                                 ----SGNVSPSKGKMDETVNINAGNNI-EITRNGKNIDIATSMTP-----QFSSVSLGAG
                                                                                                                                                          -GNSRGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AE002342; AAF39550.1; TC0741; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                              882
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KG--SGTPTSSQSVDM--STDTSDLDTSDLDTNNQTNGDINTNDNSNNVDG
                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA;
                                                                                                                                                                                                                                                                                                                                                                                            -----GVSDTESTNG-NNSGKTTSTEENGDPSGPDILAAVRKHLD
32, Created)
32, Last sequence update)
40, Last annotation update)
nding protein precursor (Hem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1007
                                                                                                                                                                                                          -GK----SMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTAS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             07 HYPOTHETICAL PROTEIN 104006 MW; 842800C0871B1518
                                                                                                                                                                                                                                    -QNLGDIIHDVEQNGSAKETVVSPYRGGGGNTSSPIGLA-SLLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 183; DB 1
Pred. No. 0.049;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                 917
                                                                                                                                                                                  -----KLVKNGGN--IPGETTLAEL
 (Heme:hemopexin utilization
                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1; Length 1007;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TC0741.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                              --RITNVAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            248;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                              486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 116
                                                                                                                                                                                                                                    826
                                                                                                                                                                                                                                                                                                                                       710
                                                                                                                                                                                                                                                                                                                                                                 455
                                                                                                                                                                                                                                                                                                                                                                                           654
                                                                                                                                                                                                                                                                                                                                                                                                                    405
                                                                                                                                                                                                                                                                                                                                                                                                                                              605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    77
                                                                                                                                                                                                         574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            38;
```

```
Вb
                                                                                                                                                                          δÃ
          Ş
                               밁
                                                 Qy
                                                                        뮵
                                                                                        δÃ
                                                                                                                                  Ş
                                                                                                                                                        D
                                                                                                                                                                                               Вp
                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
Matches 119; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  use by non-profit institutions as long as its content is in no modified and this statement is not removed. Usage by and for commercentities a license agreement (See http://www.isb-sib.ch/announ or send an email to license@disb-sib.ch).
                                                                                                                                                                                                                                                                                          REPEAT
REPEAT
DOMAIN
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                           REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
REPEAT
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Cope L.D., Thomas S.E., Latimer J.L., Slaughi Mueller-Eberhard U., Hansen E.J.; "The 100 kDa haem:haemopexin-binding protein
                                                                                                                                                                                                                                                                                                                                                                                                                             REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A. STRAIN=NTHI N182; MEDLINE=95115556;
                                                                                                                                                                                                                                                                                                                                                        REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; U08349; AAA74139.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             influenzae: structure and localization.";
mol. microbiol. 13:863-873(1994).
-!- FUNCTION: BINDS HEME/HEMOPEXIN COMPLEXES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacteria; P
Haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=727;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein A).
                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Haemophilus influenzae.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IXUA.
          335
                                268
                                                                        219
                                                                                           235
                                                                                                                 179
                                                                                                                                   175
                                                                                                                                                        119
                                                                                                                                                                            120
                                                                                                                                                                                                59
                                                                                                                                                                                                                     65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SUBCELLULAR LOCATION: Secreted
QADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQN-SGWNLD: | : : : : : | | | | : : : |
                                                                                                                                                                                                                    VQRTVAVLIVNSDKEGTGEKEKVE--ENSDWAVYFNEKGVLTAREITLKAGDNLKI---K 119
                                                                                 SDNVDFVRTYDTVEFLSADTKTTTVN--VESKDNGKKTEVKIGAK----
                                                                                                                           TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                           QNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTN-----GD
                                                                                                                                                                                                INQTSDKVQINWHSFDIGQNKEVEFKQPSENSVAYNRVTGGNASQIQGKLTANGKVYLAN
                               LEATKVSNRNGKVVLSADNVQLNNESNIKGEIVNFGTEVTSNEDK--
                                                   --TSVIKEKDGKLVTGKDKGE-NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTG
                                                                                                                                                       PNGVIITKGAEINVAGLLATTKDLEQISENSNSYQFTRKTKDRQVVKEGQVINEGEIKAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Proteobacteria; gamma subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Signal;
                                                                                                                                                                                                                                        Conservative
                                                                                                                 DEVINKG-----NINV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PubMed=7815944;
                                                                        -GISVALEDNTVRGIVQNEGSIKAGEITLSAKGRKEALDSLVMNNGV
                                                                                                                                                                                                                                                                                                     917
38
38
33
38
668
668
116
208
208
208
208
208
170
170
                                                                                                                                                                                                                                                 6.1%;
                                                                                                                                                                                                                                                                                           100148 MW;
                                                                                                                                                                                                                                        92;
                                                                                                                                                                                                                                        Score 182; DB Pred. No. 0.0492; Mismatches
                                                                                                                                                                                                                                                                                 3-2.
W; 7FF39BB8C046539D
                                                                                                                                                                                                                                                                                                                 3-1-X 6
                                                                                                                                                                                                                                                                                                                                                                                                                                       BY SIMILARITY.
HEME/HEMOPEXIN-BINDING
3 X 5 AA TANDEM REPEATS
                                                                                                                                                                                                                                                                                                                          AA APPROXIMATE TANDEM
                                                                                                                                                                                                                                                                                                                                                                                                 AA APPROXIMATE REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Slaughter
                                                                                                                 EKNSTINGKVYLSSGYNFT - - - - FTL
                                                                                                                                                                                                                                                   DB 1
                                                                                                                                                                                                                                                          1;
                                                                                                                                                                                                                                         223;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pasteurellaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C
                                                                                                                                                                                                                                                          Length 917;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Haemophilus
                                                                                                                                                                                                                                                                                            CRC64;
                                                                                                                                                                                                                                         Indels
                                -KLKITSKTGSKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gh a collaboration - EMBL outstation -
                                                                                                                                                                                                                                        124;
                                                                                                                                                                                                                                                                                                                          REPEATS
                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in no way
                                324
                                                                                                                                                                                                118
                                                    334
                                                                                                                 218
                                                                                                                                    234
                                                                                                                                                                            174
            393
                                                                        267
                                                                                            277
                                                                                                                                                                                                                                         23;
```

```
RESULTY 14
SLAP_CAME
ID SLAP C
AC P35827
DT 01-UN
DT 01-U
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               많
                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                        Query Match
Best Local S
Matches 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-JUN-1994
01-JUN-1994
01-OCT-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                      the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for commodified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-JUN-1994 (Rel. 29, Last sequence update)
01-OCT-1994 (Rel. 30, Last annotation update)
S-layer protein (Surface array protein) (SAP)
                                                                                                                                                                                                                                                                                                                                                                                      entities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This SWISS-PROT entry is copyright. It is produced through a coefficient the Swiss Institute of Bioinformatics and the EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Blaser M.J., Gotschlich E.C.;
J. BLO1. Chem. 265:19972-1972(1990).
-i- FUNCTION: THE S-LAYER IS A PARACRYSTALLINE MONO-LAYERED ASSEMBLY
OF PROTEINS WHICH COAT THE SURFACE OF BACTERIA. THIS PROTEIN IS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SLAP_CAMFE P35827;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Campylobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Campylobacter fetus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=91035477; PubMed=2229082;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        structure
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Surface array protein of Campylobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=90354448; PubMed=2387868;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A., AND SEQUENCE OF STRAIN=84-32 / 23D;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Blaser M.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        394
                                                        212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           325
                                                                                                                                                        Local Similarity
nes 147; Conserv
  66
                                                                                                        10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Biol. Chem. 265:14529-14535(1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CRITICAL FOR VIRULENCE.
SUBCELLULAR LOCATION: CELL WALL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NFYIDGGVSRNNSRYEYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNV----DGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SFIQTEALSSLLANNGKVNLKGNDVNISGNINIDSFRGTDSLLKLTNQGHINIDHADINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TSPKINFKGKSVNINGNFGRENSGTHYNEERKTLNTEVNIDVPGAENIRIADDKDNTETD
QRTVAVLIVNSDKEGTGE-----KEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                     DDTFNGTTYVGNGTNKSTLSAFDKTRWSVLGRDTLNAIFTAITRAALLTDQAE-LIITKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MMAIGGGTYRGEAGYAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KGRLFVVTSLQNDVDFKSNITITDSKINLGNGAMGLGRSVNEDDYATRWKRAEKSQRKKF
                                                                                                     NSALNAWVVVSELTRNHTKRASATVKTAVLA----TLLFATVQASANNEEQEEDLYLDPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -GNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRIT-
                                                                                                                                                                                                                                                                                                                                         J05577; AAA23032.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----KAVAGSSGKV-----ISGNVS------PSKGKMD-ETVNINA
                                                                                                                                                                                                                                                                                   S-layer.
933 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Rel.
(Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gotschlich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -DMRNV-----VFNQVDEVILAGGFEKVNLDKIVAT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                      96757 MW;
                                                                                                                                                                           6.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      epsilon
                                                                                                                                                           82;
                                                                                                                                                   Score 181.5; DB Pred. No. 0.053; 2; Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                      F88C729B4BA5B1E9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            THIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                fetus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (SAP).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BACTERIUM
                                                                                                                                                                                                     DB 1;
                                                                                                                                                           270;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Campylobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Cloning
                                                                                                                                                                                                        Length
                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IS COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                        173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a collaboration - MBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GOT
                                                                                                                                                                                                                                                                                                                                                                                                                    ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ВУ
                                                                                                        65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     424
                                                     270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 on
                                                                                                                                                           32;
```

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
 RESULT 15
OMPB_RICJA
ID OMPB_RICJA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                         10-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmpB B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide]
OMDR
                                                                                                                                                                                                                                                                                                                                                      006653;
30-MAY-2000
                                                                                                                                                                                                                                                     OMPB
                  ÷
                                                                                     japonica.";
Submitted (MAY-1997)
                                                                                                                                                                                        NCBI_TaxID=35790;
                                                                                                                                                                                                                        Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                        30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation updat
                                                                                                                                  Jchiyama
                                                                                                                                                STRAIN-YH;
                                                                                                                                                              SEQUENCE FROM N.A
                                                                                                                                                                                                          Rickettsiaceae;
                                                                                                                                                                                                                                       Rickettsia japonica
                                                                                                                   Sequencing of the gene encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   271
                                                                                                                                                                                                                                                                                                                                                                                                                                                              804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                            mitted (MAY-1997) to the EMBL/GenBank/DDBJ
FUNCTION: THE 120 KDA SURFACE EXPOSED PROT
STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE &
VIRULENCE FACTOR AND/OR IMMUNOGEN DURING 1
SIMILARITY).
FUNCTION: THE 32
(BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                            GNIVVDLVAGGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNWIIKGTASGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VSMIDASALKAGLTFDASAI-TLG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IDNVDGNA-RAGI----AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSIS-DG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LSVDG--DALNVGS-KKDNKPVRITNVAPGVKEGDVTNV----AQL----KGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TLTINKDQVINFTAADAGSVKLITVKLNDVTALMIVVKIVLDAAAKDTNIALGTAAADKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TVNINAGNNIEITRNGKN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AEVETLVN-----IDTTAFNALQSVSFGKTGQGGKF-SVKTGTGDDKIEFVGTTLTEGSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RYCKFKRAAAKVKLNTTAATDQTVTLKANATDNSLEFDSATAKTTSVTASGSGKTLVIKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATNVALNGGMDKLATVTLDNAALTAAIDI-----KSASTLNLINSSVNGPKHLYSSKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVN-VESKDNG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATNDTITLTSANAATSVNLKQRQAKDATITSAMQQKYNNRRNRIATITSATAVENLTVKH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GIGSTLTDTLLNTGATTNVTNDNVTD------DEKKRAA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TGT-----ITAFTAAGTGKVDVVA-GKISALTADSR------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RTNVENINIISDLETSGDFVFNGYEKVG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LVIDTGIETLNITSLVKATSPETTANTV-NAKLTDVTSIIIDGMQITLGHAGTAGTDYSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDAPGNDTIAMKSAALTSANFTMIKNIENVAISDAVATADLSSSAFKNSVIITTKEAADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEVIDAVNKAGWRMKTTTAN------GOTGQADKFETVTSGTNVTFASGKGTTATVSK-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -DDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAG---SSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KKTEVKIGAKTSVIKEK--------DGKLVTGKDKGENGSSTDEGEG--
                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                          Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        576
                                                                                                                                                                                                                                                                                                                                                                                                                                                              815
                KDA
                BETA
                                                                                                                                                                                                       alpha subdivisi
eae; Rickettsia.
                PEPTIDE MAY
                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                        subdivision;
                                                                                                                   the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----IDIATSMTPQFSSVSLGAGADAPT
                                                                                                                                                                                                                                                                                                                                                                                      1656
                                                                                                                  protein rOmp B of Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ANATIKGGS
                                                                                                                                                                                                                                                                                                                                                                                      ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FNVLGDIVS - - FATDASKSVNVET
                                            PROTEIN IS A MAJOR
OLE AS A RICKETTSIAL
ING INFECTION (BY
                  SERVE
                                                                                                                                                                                                                        Rickettsiales;
                                                                                      databases
                  AS
                  A MEMBRANE ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -GADSITVKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TSVNLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LVTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SVKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        803
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              762
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     703
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       267
```

```
Query Match 6.0
Best Local Similarity 21.9
Matches 159; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DOMAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; AB003681; BAA20138.1;
InterPro; IPR003858; rOmpA_rOmpB.
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED LAYER WITH HEXAGONAL SYMMETRY.
-!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Antigen; S-layer; Cell wall.
CHAIN 1 1338
     706
                                                        535
                                                                                                         647
                                                                                                                                                          484
                                                                                                                                                                                                              588
                                                                                                                                                                                                                                                            439
                                                                                                                                                                                                                                                                                                                  528
                                                                                                                                                                                                                                                                                                                                                                   410
                                                                                                                                                                                                                                                                                                                                                                                                                      471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        254 LNLQAGGTTINFNGTDGTGRLVLLSKNGAATDF---NVTG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10 NSALNAWYVVSELT-----RNHTKRASATV---KTAVLATLLFATVQASANNEEQEE 58
FGSKGARADTVLNVGEGVNL----YATNITTTDANVGSFVFNAGGKNIVSGTVGGQQGNK 761
                                                                                                                                                                                                                                                                                                                                                                                                                 LSGTHTAELRLGNAGSVFKLAD---GTVINGKVNQTVLVGGVLAAGAITLDGSATITGDI 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTN- 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DLYLDPVQRTVA-----VLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SNANNLAVTVSEDTTLGFINNAANNANRFNLTLDAGKTLTTTGQGITNVQSAATHN----
                                                   LPGK-----SMMAIGGGTYRGEAGYA-----IGYSSISDGGNWIIKGTASGNSRGH
                                                                                                                                                                                                        LAIA-TDQTGVVDASSLTNAQTLTISGTIGIIGANNTTLGQFNIGSSKTTLNGGNVAINE
                                                                                                                                                                                                                                                            IATSMTPQFSSVSLGAGADAPTLSVDG----
                                                                                                                                                                                                                                                                                                               GNGGGGAALQSITLANDATKTLTLGGANIISANGGTINFQANGGTIKLTSTQNNIVVDCD
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----TATVSKDDQGNITVMYDVNVGDALN--VNQLQNSGWNLDSKAVAGSSGKVISGNV 409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DTMTLTGNFTGDANNPGNTAG--VITFAANGTLASASADANVAVTNNITAIEASGVGVVQ 470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EVIDAV-----NKAGWRMKTTTANG--QTGQADKFETVTSGTNVTFASGKGT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KDMVIQSANANGQVNFRHIVDVGIDGTTAFKTAASIVAITQNSNFGTTDFGNLAAQVTVP 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GIIELNTVAINGQLIANAG-----PANAVIGTNNGAGRAAGFVVSVDNGKAATIDGQVYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVN-----VESKDNGKKTEV--KIGA 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----GDTTVHLNGIGSTLTDTLLN-TGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNALI-VNGANGTLNVTNGFIQVSD-----KSF-ATVKAINI-GDGQGFMFNTNATNANA 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----AQNIVAKFNGGAAIANNDLSGLG---TIDFGAAASTLVFDLANPTTQKAPLILA
                                                                                                       LVIG-NNGSVQFAHNTYLITRTTNAAGQGKIIFNPVVNNNTTLAAGTNLGSAANPLAEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1339 16
528 5
1656 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.0%; Score 181; DB 1; Length 1656; 21.9%; Pred. No. 0.11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120 KDA SURFACE-EXPOSED PROTEIN.
56 32 KDA BETA PEPTIDE.
183 POLY-GLY.
168097 MW; 3132A69C9DD5999F CRC64;
                                                                                                                                       ---TNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 534
                                                                                                                                                                                                                                                                                                                                                                80; Mismatches 284;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----KDGKLVTGKDKGENGSSTDEGE--GLVTAK 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                            -----DALNVGSKK---DNKPVRITN 483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels 202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----SLGGNLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BY A S-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   352
                                                                                                    705
                                                                                                                                                                                                                                                                                                               587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 35;
```

DP GA

Qy

δÃ

Вb

5 B 5

망

2 40 A0 B

Qy 581 FGASA 585 | | | Db 762 FNTVA 766

Search completed: July 3, 2002, 08:29:38 Job time: 1149 sec

•.

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                  Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Minimum DB seq
Maximum DB seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OM protein - protein search, using sw model
                                                                                                                                                                                                         ŏ.
    Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                         2984
2971.5
2885.5
2781.5
27758.5
2751.5
2747.5
2747.5
2738.5
2738.5
2738.5
2735.5
                                                                                                                                                                                                      Score
                                                                                                                                                                  3003
                                                                                                                                                                                                                                                                                                          SPTREMBL_19:*

1: sp_archea:*
2: sp_bacteria
3: sp_fung1:*
4: sp_human:*
5: sp_inverteb
6: sp_mammal:*
7: sp_mhc:*
8: sp_organell
9: sp_phage:*
10: sp_plant:*
11: sp_virus:'
13: sp_verteb)
14: sp_urclas:
15: sp_verteb;
16: sp_bacter
17: sp_archea
                                                                                                                                                                                                    %
Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      length: 0
length: 2000000000
   100.0
99.9
99.9
99.0
99.0
96.1
91.9
91.5
91.5
91.3
91.3
91.3
91.3
91.8
91.8
91.8
91.8
91.8
91.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              562222 seqs, 172994929 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-771-382-1
3003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       July 3, 2002, 08:09:19; Search time 168.02 Seconds (without alignments) 608.499 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVVVS.....TASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sp_archea:*
sp_bacteria:*
sp_fungi:*
                                                                                                                                                                                                                                                                                                          sp_vertebrate:*
sp_unclassified:*
sp_rvirus:*
sp_bacteriap:*
sp_archeap:*
                                                                                                                                                                                                                                                                                                                                                                                                                      sp_organelle:*
                                                                                                                                                                                                                                                                                                                                                                                                                                  sp_mammal:*
sp_mhc:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                          sp_invertebrate:*
                                                                                                                                                                                                                                                                                                                                                                                             sp_plant:*
                                                                                                                                                                                                                                                                                                                                                                        sp_virus:*
                                                                                                                                                                                                                                                                                                                                                                                   sp_rodent:*
                                                                                                                                                                                                       Length
   591
592
592
594
594
598
598
598
598
                                                                                                                                                                                                       В
                                                                                                                                                                                 16
  5 Q9JPS1
Q9JPS1
Q9JQS7
Q93QY3
Q9AQF0
Q9JPS3
Q9JPS3
Q9JPS2
Q9JPS2
Q9JPB1
Q9JPB1
Q9JPB0
Q9JPB0
Q9JPS0
Q9JPS0
Q9JPS0
Q9JPS0
Q9JPS0
Q9JPS0
Q9JPS0
Q9JPS0
                                                                                                                                                                                                       Đ
                                                                                                                                                                                                                                          SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           562222
Q9jr18 neisseria m
Q9jps7 neisseria m
Q9jqy3 neisseria m
Q9aqf0 neisseria m
Q9apf0 neisseria m
Q9jps3 neisseria m
Q9jps6 neisseria m
Q9jps2 neisseria m
Q9jpi3 neisseria m
Q9jpi7 neisseria m
Q9jpt0 neisseria m
                                                                                                                                                                                                     Description
```

Ü	4	ü	2	=	0	39	38	37	36	5	34	$^{3}$	32	3	30	29	28	27	26	25	24	23	22	21	20	19	18	17
227	229	230.5	232.5	233.5	233.5	239.5	239.5	240	243	244.5	249.5	368.5	371.5	378	393	435.5	1061.5	1247	2447.5	2449.5	2464.5	2479	2490	2528.5	2532	2573.5	2574.5	2611
	7.6		•	•									•			•		41.5		•	•			•	•			
832	989	1039	1536	3930	2276	1040	1039	1265	1953	1004	1291	2712	1190	1107	2059	1299	1098	2353	530	526	592	589	589	600	595	592	598	599
	N					N	N	2	16	16	16	16	16												N	2	N	2
054356	Q9XD84	Q9L6T8	Q48031	Q98E20	Q93TY6	Q9AL50	Q9L6T7	Q9FDA0	098нл2	Q9PD63	Q92KQ7	Q9F3X5	Q9PC04	Q9F2D8	Q9PD50	Q9F3X6	Q48152	P71401	Q9JPS1	Q9JPS4	Q9JQW4	Q93QY1	Q9JPIO	Q9JPS5	Q9JPH0	Q93QY2	Q9JPR7	Q9JPS8
O54356 moraxella c			Q48031 haemophilus		S	Q9al50 shigella fl	Q916t7 escherichia	Q9fda0 xanthomonas	rhizobiu	xylella fa	rhizobium	Q9f3x5 pasteurella		almonell		Q9f3x6 pasteurella		P71401 haemophilus	Q9jps1 neisseria m		Q9jqw4 neisseria m	Q93qy1 neisseria m	Q9jpiO neisseria m	Q9jps5 neisseria m	Q9jphO neisseria m	Q93qy2 neisseria m	Q9jpr7 neisseria m	Q9jps8 neisseria m

## ALIGNMENTS

```
Q9JPS7
ID QS
AC QS
DT 0:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                     Qy
                                                                                                                                                                                                              В
                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                         RESULT
                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Identification and characterization of a gene encoding a numembrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
R EMBL; AF226375; AAF42524.1;
R EMBL; AF226376; AAF42195.1;
R EMBL; AF226376; AAF42510.1;
R EMBL; AF226374; AAF42519.1;
R EMBL; AF226374; AAF42519.1;
R EMBL; AF226374; AAF42519.1;
R EMBL; AF266374; AAF42519.1;
R EMBL; AF2663754; AAF42519.1;
R EMBL; AF2663754; AAF42519.1;
R EMBL; AF266374; AAF42519.1;
R EMBL; AF2663754; AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "Complete genome : MC58.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Science [3]
Q9JPS7
Q9JPS7;
01-OCT-2000
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Complete
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SPECIES=N.meningitidis; STRAIN=PMC21; Peak I.R., Srikhanta Y., Dieckelman M
                                                                                                                                                                              541
                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                              541
                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 / Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                          N
                                                                                                                                                                                                                                                                                                                                                                                                                               GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASYKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                  ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                        NINAGNNIEITRNGKNIDIATSMTPQFSSYSLGAGADAPTLSYDGDALNYGSKKDNKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                        NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                 ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              287:1809-1815(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          proteome.
591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             100.0%; ilarity 100.0%; Conservative 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Fraser C.M., Nenome sequence
 (TrEMBLrel.
                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62112
   15,
15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Moxon E.R., Rappuoli R., Venter J.C.;
e of Neisseria meningitidis serogroup B strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MW.
 Created)
Last sequ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 3003; DB 1
Pred. No. 1e-118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7C22F3CAE7F73EC6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
   sequence update)
                                                       591
                                                       Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                591
                                                                                                                                              591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         novel outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                           480
                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
```

RESULT Q93QY3 ID Q9 AC Q9

ω

Q93QY3 Q93QY3;

PRELIMINARY;

PRT;

591

A

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                         밁
                                                        δÃ
                                                                                   밁
                                                                                                       QΥ
                                                                                                                               В
                                                                                                                                                 Qy
                                                                                                                                                                          B
                                                                                                                                                                                              Q
                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                           ρy
                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLING-20175756; PubMed=10710308;
A pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
A Caleotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.
A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Venter C.
A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.
A Moxon E.R., Grandi G., Rappuoli R.;
Tidentification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
R EMBL; AF226366; AAF42515.1;
C SEQUENCE 591 AA; 62113 MW; 533453CAE5A91E1F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A. STRAIN=BZ147;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Prote
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-DEC-2001 (TremBLrel. OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria
                                                                                                          421
                                                                                                                                                                            301
                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                            241
541
                   541
                                         481
                                                              481
                                                                                    421
                                                                                                                                361
                                                                                                                                                      361
                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                  NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN 180
                                                                                                                                                                                                                                                                                                                                                                    YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
          MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                              NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                                                                                                                                                                            NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                          YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
MAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                          ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                     NINAGNNIETTRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                    ITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                              590;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                          99.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             . 19, La
GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last
                                                                                                                                                                                                                                                                                                                                                                                                                                              ŗ
                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2999; D
Pred. No. 1.5e
1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                           .5e-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        update
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            18;
                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Capecchi
                     591
  591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Zuo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        chi B.,
Nuti S
                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         r.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ₽.,
                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         s.
                                                                                                                                                                                                                                                                                        240
                                                                                                            480
                                                                                                                                                        420
                                                                                                                                                                             360
                                                                                                                                                                                                  360
                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                      480
                                                                                                                                  420
                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
```

1;

```
QΥ
                                                                                       망
                                                                                                   Qy
                                                                                                                 Вþ
                                                                                                                           ρ
                                                                                                                                          Ъ
                                                                                                                                                    Ş
                                                                                                                                                                   뮹
                                                                                                                                                                            δõ
                                                                                                                                                                                         Дb
                                                                                                                                                                                                     δ
                                                                                                                                                                                                                   Db
                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                     문
                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                     Query Ma
Best Loc
Matches
    Q9AQF0;
Q9AQF0;
01-JUN-2001 (
01-JUN-2001 (
01-JUN-2001 (
OUTER MEMBRAN
                                                                                                                                                                                                                                                                                                                                                                                                                                  01-DEC-2001
01-DEC-2001
01-DEC-2001
NHHA OUTER M
                                                                                                                                                                                                                                                                                                                                                                                                     NHHA.

Neisseria meningitidis.

Bacteria; Proteobacteria;

NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                              "Identification and characterization of a gene encoding a n membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157606; AAK68867 l; -.
                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                           481
                                                                                                     481
                                                                             541
                                                                                                                   421
                                                                                                                               421
                                                                                                                                           361
                                                                                                                                                      361
                                                                                                                                                                   301
                                                                                                                                                                                           241
                                                                                                                                                                                                        241
                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                        121
                                                                                                                                                                               301
                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                    / Match
Local Similarity
nes 588; Conser
                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                19
                                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                  NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVR
                                                                                                                                                SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                          GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                           SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                           VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                                                                                                                  VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                                                                                                                                   GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
     N-2001 (TrEMBLrel.
N-2001 (TrEMBLrel.
MEMBRANE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                              FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                  Ol (TremBLrel. 19, 0)
Ol (TremBLrel. 19, 0)
Ol (TremBLrel. 19, 0)
R MEMBRANE PROTEIN.
                       (TrEMBLrel.
                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                             N.A.
                                                                                                                                                                                                                                                                                                                          99.48;
           17,
17,
17,
                                                                                                                                                                                                                                                                                                                                                                                                                 beta
                                                                                                                                                                                                                                                                                                                    Pred. No. 6.2e
1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                         Last
Last
           Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
                                                                                                                                                                                                                                                                                                                                                                                                                 subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                        sequence up
                                    592
                                                                                                                                                                                                                                                                                                                           DB 2;
.2e-118;
                                    A
                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
lon update)
                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseriaceae;
           update)
                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                     Indels
                                                                  591
                                                                                                                                                                                                                                                                                                                                                                           s M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria
                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                           outer
                                                                                                                                          420
                                                                                                                                                      420
                                                                                                                                                                                                        300
                                                                                                                                                                                                                   240
                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                         60
                                                                                                                   480
                                                                                                                                                                   360
                                                                                                                                                                               360
                                                                                                                                                                                           300
                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                     0,
밁
                                                                                                                                                                                                                                                                                    Q
                                                                                                         δÃ
                                                                                                                        Дb
                                                                                                                                γ
                                                                                                                                               В
                                                                                                                                                          δÃ
                                                                                                                                                                        р
                                                                                                                                                                                  δÃ
                                                                                                                                                                                                 Вb
                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                  Query Ma
Best Loc
Matches
                              GNA992
                                                                                                            540
                                                                                                                                                                                                                          241
                                                                                                541
                                                                                                                        481
                                                                                                                                    480
                                                                                                                                                421
                                                                                                                                                            420
                                                                                                                                                                        361
                                                                                                                                                                                     360
                                                                                                                                                                                                 301
                                                                                                                                                                                                              300
                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                           ш
                                                                                                                                                                                                                                                                                                                                      \vdash
```

```
S Neisseria meningitidis.

G Bacteria; Proteobacteria; beta subdivision; Neisseriaceae;
C Bacteria; Proteobacteria; beta subdivision; Neisseriaceae;
X NCBI_TaxID=487;
X NCBI_TaxID=487;
N [1]
P SEQUENCE FROM N.A.
C STRAIN=MC58;
C STRAIN=MC58;
C STRAIN=MC58;
A Peak I. R., Srikhanta Y., Dieckelman M., Moxon E.R., Jenning Train Tentification and characterisation of a gene encoding a proteomorphic of the Emblance of the Company of the Company of the Embly GenBank/DDBJ databases.
C SEQUENCE 592 AA; 62290 MW; 168986A97381EFC5 CRC64;
                                                                                              Q9JPS3 PRELIMINARY;
Q9JPS3;
01-OCT-2000 (TrEMBLrel. 15, C
01-OCT-2000 (TrEMBLrel. 15, I
01-MAR-2001 (TrEMBLrel. 16, I
01-MAR-2001 (TREMBLREL GNA992
                                               Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            y Match
E Local Similarity
Ches 586; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VSKDDQGNITYMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNYTFASGKGTTAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLYTGKDKGENGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGIGSTLIDTLLNIGATINVINDNVIDDEKKRAASVKDVLNAGWNIKGVKPGITASDNVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEE-QEED
                                                                                                                                                                                                                                                                                        MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                        QNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNERPRKKD
                                                                                                                                                                                                                                                                        MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                         RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHL
                                                                                                                                                                                                                                                                                                                                         RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKS
FROM
                                                               meningitidis
                                                 Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99.0%;
                                                                                               l. 16, Last
1 GNA992.
                                                 beta
                                                                                                                                   Created)
Last seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2971.5;
Pred. No. 2.16
3; Mismatches
                                                 subdivision;
                                                                                                                 sequence u
annotation
                                                                                                                                                                                    590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2.1e-117:
                                                                                                                                                                                    A
                                                                                                                                     update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseriaceae;
                                                 Neisseriaceae;
                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ngs M.
novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria
                                                 Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      outer
                                                                                                                                                                                                                                                                                                                                                                                                                                             479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              59
                                                                                                                                                                                                                                                                                                                                                                                                           480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
```

```
RESULT
Q9JPS6
Q9JPS6
AC Q0
AC Q0
DT Q0
DT Q0
DT Q0
CGN Q0
CGN Q0
CGN Q0
COX NN
                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                рь
                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                Дb
                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                          29
                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             X MEDLINE-20175756; PubMed=10710308;

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

A Hood D.W., Jeffries A.C., Saunders M.J., Granoff D.M., Venter C.,

A Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

"Identification of Vaccine Sequencing.";

Science 287:1816-1820(2000).

EMBL; AF226378; AAF42527.1;

EMBL; AF226378; AAF42527.1;

EMBL; AF226378; AAF42527.1;
                                                   01-OCT-2000 (TrEMBLrel. 15, Created) 01-OCT-2000 (TrEMBLrel. 15, Last seq 01-MAR-2001 (TrEMBLrel. 16, Last ann OUTER MEMBRANE PROTEIN GNA992.
                                                                                                                       Q9JPS6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-NGE28;
 Bacteria; Proteobacteria;
NCBI_TaxID=487;
                          Neisseria meningitidis
                                                                                                                                                                                          539
                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                              479
                                                                                                                                                                                                                                                                                                                                                      359
                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    119
                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                         MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                            RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                 SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                       VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLSATVQANATDEEDEED-
                                                                                                                                                                                                                                                                                                                                                     SKDDQGNITYKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -LDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                574;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               96.1%;
milarity 97.0%;
Conservative
                                                                                                                       PRELIMINARY;
               beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 2885.5; DB 2
Pred. No. 8.4e-114;
4; Mismatches 11;
               subdivision;
                                                                  sequence update) annotation updat
                                                                                                                       600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bartolini E., Capecchi B., rchetti E., Mora M., Nuti S
                                                                                                                       AA
                Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                          590
                Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ,
,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                        539
                                                                                                                                                                                                                                                                                                    478
                                                                                                                                                                                                                                                                                                                                                                                                           358
                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                            298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2;
```

```
RESULT
Q93QY4
ID Q9
AC Q9
DT 01
DT 01
                                                                                                                                                                                 Qy
                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                             QΨ
                                                                                                                                                                                                                                                                                                                                                                  맑
                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                  Ş
                                                                                                                      В
                                                                                                                                        ρy
                                                                                                                                                              밁
                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.
A Moxon E.R., Grandi G., Rappuoli R.,
"Identification of Vaccine Candidates Against Serogroup B
"Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
R EMBL; AF226371; AAF42520.1;
SEQUENCE 600 AA; 62762 MW; 36256963E0598CD1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
Q93QY4
Q93QY4;
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      [1]
SEQUENCE FROM N.A.
STRAIN=E26;
MEDLINE=20175756; PubMed=10710308;
                                                                                600
                                                                                                   591
                                                                                                                       540
                                                                                                                                          531
                                                                                                                                                              480
                                                                                                                                                                                  471
                                                                                                                                                                                                       420
                                                                                                                                                                                                                          411
                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                 351
                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                        291
                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                             117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        y Match
Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Σ
                                                                                                                                VQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQ 590
                                                                                                                                                              TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                   KIKQ-----NGTNETYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                Σ
                                                                                                                                                                                                                                            ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                         KIKQNTDENTNASSFTYSLKKELTDLTSVGTEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                      VQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQ
                                                                                                                                                                                                       PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNV
                                                                                                                                                                                                                 PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               92.0%;
ilarity 91.7%;
Conservative 1
 (TrEMBLrel.
                               PRELIMINARY;
  19,
19,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; Score 2761.5; DB 2
; Pred. No. 1.3e-108;
14; Mismatches 25;
 Created)
Last sequence
                               PRT;
                                594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Capecchi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Zuo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          chi B.,
Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      н.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                 539
                                                                                                                                                                                                                           470
                                                                                                                                                                                                                                               419
                                                                                                                                                                                                                                                                   410
                                                                                                                                                                                                                                                                                       359
                                                                                                                                                                                                                                                                                                          350
                                                                                                                                                                                                                                                                                                                             299
                                                                                                                                                                                                                                                                                                                                                290
                                                                                                                                                                                                                                                                                                                                                                    239
                                                                                                                                                                                                                                                                                                                                                                                       230
                                                                                                                                                                                                                                                                                                                                                                                                                                                  119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              56
```

ω ··

```
δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                           Dъ
                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DT DE CONTRACTOR OF CONTRACTOR CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Ma
Best Loc
Matches
                                             Q9JPS2;
01-OCT-2000 (TrI
01-OCT-2000 (TrI
01-MAR-2001 (TrI
0UTER MEMBRANE I
GNA992.
Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings "Identification and characterization of a gene encoding a rmembrane protein of Neisseria meningitidis."; Submitted (JUN-199) to the EMBL/GenBank/DDBJ databases.

EMBL; AF157605; AAK68866.1; -.

SEQUENCE 594 AA; 62297 MW; 9DDD48B04B3A8EA2 CRC64;
                                                                                                                           Q9JPS2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN=EG327;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-DEC-2001 (TrEMBLrel. 19, NHHA OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria
                                                                                                                                                                                                                                    534
                                                                                                                                                                                                                                                                    477
                                                                                                                                                                                                                                                                                                 474
                                                                                                                                                                                                                                                                                                                                417
                                                                                                                                                                                                                                                                                                                                                             415
                                                                                                                                                                                                                                                                                                                                                                                          357
                                                                                                                                                                                                                                                                                                                                                                                                                        355
                                                                                                                                                                                                                                                                                                                                                                                                                                                       297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               y Match
Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -
                                                                                                                                                        æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQBEDL
||||||||||||||| : ::||
MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD----DDDL
                                                                                                                                                                                                                    YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                              KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                      GENGSSTDEGEGIVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTVHLNG IGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                     YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
 meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitidis
                                             0 (TrEMBLrel. 15,
0 (TrEMBLrel. 15,
1 (TrEMBLrel. 16,
RANE PROTEIN GNA99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            91.9%;
                                             . 15, Last sequence update)
. 16, Last annotation update)
GNA992.
 beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2758.5;
Pred. No. 1.8e
14; Mismatches
                                                                                           Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Last
                                                                                                                           PRT;
 subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               annotation
                                                                                                                          594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5; DB 2; .8e-108;
                                                                                                                          3
 Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11;
 Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                     594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       outer
                                                                                                                                                                                                                                                                                              533
                                                                                                                                                                                                                                                                                                                                                          473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                              476
                                                                                                                                                                                                                                                                                                                                                                                        416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     116
                                                                                                                                                                                                                                                                 536
                                                                                                                                                                                                                                                                                                                                                                                                                       414
                                                                                                                                                                                                                                                                                                                                                                                                                                                       356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4;
Qy
                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                       g
                                                                                                                                                                                          QY
                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
```

```
A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
A Moxon E.R., Grandi G., Rappuoli R.,
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Cscience 287:1816-1820(2000).
R EMBL; AF256379; AAF42528.1; -.
C SEQUENCE 594 AA; 62114 MW; 1E2A63A78F53D256 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 551; Conserv
Q9JPI3;
Q9JPI3;
Q1-CT-2000
01-CCT-2000
01-MAR-2001
OUTER MEMBRA
GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN=NGE31;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=487;
                                                                                                                                              537
                                                                                                                                                                      534
                                                                                                                                                                                                  477
                                                                                                                                                                                                                         474
                                                                                                                                                                                                                                                    417
                                                                                                                                                                                                                                                                             415
                                                                                                                                                                                                                                                                                                       357
                                                                                                                                                                                                                                                                                                                               355
                                                                                                                                                                                                                                                                                                                                                           297
                                                                                                                                                                                                                                                                                                                                                                                                                                     235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                        'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
|||||||||||||| : ::||
MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQASTTD---DDDL
                                                                                                                                             TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                                                                                                                                                                                                                               KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK
                                                                                                                                                                                                                                                                                                       GTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                   GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                MEMBRANE
                           (TrEMBLrel. (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                     (TrEMBLrel.
                                                                              PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      91.6%;
92.1%;
                         15, Created)
15, Last sequence update)
16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           μ
3,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score
Pred.
                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        No. 3.56
                                                                                594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .5e-108;
ies 23;
                                                                                A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              chi B.
Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     н.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                              594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ່ ໝ
                                                                                                                                                                                                  536
                                                                                                                                                                                                                           533
                                                                                                                                                                                                                                                                              473
                                                                                                                                                                                                                                                    476
                                                                                                                                                                                                                                                                                                        416
                                                                                                                                                                                                                                                                                                                               414
                                                                                                                                                                                                                                                                                                                                                           356
                                                                                                                                                                                                                                                                                                                                                                                   354
                                                                                                                                                                                                                                                                                                                                                                                                             296
                                                                                                                                                                                                                                                                                                                                                                                                                                       294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
```

4;

```
RESULT
Q9JPH7
ID Q9
AC Q5
DT 0:
DT 0:
                                                                                                        δÃ
                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                         DЪ
                                                                                                                                                                                            Qy
                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                        밁
                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Ma
Best Loc
Matches
 Q9JPH7;
01-OCT-2000
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Sanders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
EMBL; AF226369; AAF42525.1; -. EMBL; AF226369; AAF42518.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
STRAIN=NG3/88, AND BZ232;
MEDLINE=20175756; PubMed=10710308;
                                 09ЛРН7
                                                                                                            534
                                                                                                                                 477
                                                                                                                                                                                                 415
                                                                                                                                                                                                                                                                                                          237
                                                                                                                                                                                                                    357
                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                    295
                                                                                                                                                                                                                                                                                                                                                    177
                                                                                                                                                                                                                                                                                                                                                                        175
                                                                                                                                                                                                                                                                                                                                                                                             117
                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                          355
                                                                                                                                                                                                                                                                                                                                                                                                                                       58
                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Match
                                                        10
                                                                                      KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                                   YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK
                                                                                                                                                                                                                                                               GENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                          TTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                        ----- NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD
                                                                                                                                 DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                                                                                                                                                                                                                                                        YLEPVQRTAPVLSFHADSEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                           KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                              {\tt NTDENTNASSFTYSLKKDLTDLTSVETEKLSFGANGKKVNITSDTKGLNFAKETAGTNGD}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594 AA;
 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     91.5%;
  15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1; -.
MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13;
 Created)
Last sequ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2747.5; DB 2;
Pred. No. 5.1e-108;
3; Mismatches 24;
                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1B25E03B90D04B46
  sequence
                                  594
                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                        594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        s.,
                                                                                                                                                      533
                                                                                                                                                                                                                                                                                                                                                                         234
                                                                                                                                                                           476
                                                                                                                                                                                                                     416
                                                                                                                                                                                                                                          414
                                                                                                                                                                                                                                                                356
                                                                                                                                                                                                                                                                                    354
                                                                                                                                                                                                                                                                                                          296
                                                                                                                                                                                                                                                                                                                              294
                                                                                                                                                                                                                                                                                                                                                    236
                                                                                                                                                                                                                                                                                                                                                                                              176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4;
```

```
밁
                                                 밁
                                                                        δõ
                                                                                                  망
                                                                                                                       Qy
                                                                                                                                                  DЬ
                                                                                                                                                                         Ş
                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ESOUBNCE FROM N.A.

STRAIN-BZ198, AND 297-0;

XX MEDLINE-20175756; PubMed=107710308;

XA Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Pizza M., Scarlato V., Masignani V., Bartolini E., Capecchi B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Ra Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

RA Ratti G., Santini L., Kavino S., Scarselli M., Storni E., Zuo P.,

RA Ratti G., Santini L., Kanapp B., Blair E., Mason T., Tettelin H.,

RA Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

RA Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

RA Moxon E.R., Grandi G., Rappuoli R.,

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

L. Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          O1-DEC-2001 (TrEMBLrel. 19,
OUTER KEMBRANE PROTEIN GNA9
GNA992 OR NHHA.
Neisseria meningitidis.
Bacteria; Proteobacteria; b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings "Identification and characterization of a gene encoding a nembrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF226368; AAF42517.1; -
EMBL; AF226358; AAF42507.1; -
EMBL; AF2757604; AAK68865.1; -
EMBL; AF157604; AAK68865.1; -
SEQUENCE 594 AA; 62361 MW; 436BDDED68263C5C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=BZ198;
Peak I.R., Srikhanta
                                                                                                                                                                                                                                                                                                 117
  477
                         474
                                                  417
                                                                         415
                                                                                                  357
                                                                                                                                                                                                   237
                                                                                                                                                                                                                            235
                                                                                                                                                                                                                                                   177
                                                                                                                                                                                                                                                                           175
                                                                                                                          355
                                                                                                                                                   297
                                                                                                                                                                            295
                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                    58
                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local
                                                                                                                                                                                                                                                                                                                                                                                                   Match
                                                                                                                                                                                                                                                                                                GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                               GENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                  YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                   GTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                   DENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                     551;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 91.3%;
92.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           . 19, Last ann
GNA992 (NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                     11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2740.
Pred. No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ed. No. le-107
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               annotation update]
HHA OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .
5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          novel outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           si.
                                                                                                                            414
                                                                                                                                                                            354
                                                                                                                                                                                                      296
                                                                                                                                                                                                                                                                             234
                                                                                                                                                                                                                                                                                                    176
                                                                                                                                                                                                                                                                                                                             174
                                                                                                                                                                                                                                                                                                                                                     116
                                                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                                                                                                                        57
                                                                                                                                                                                                                                                                                                                                                                                                                               60
   536
                                                     476
                                                                                                    416
                                                                                                                                                    356
                                                                                                                                                                                                                             294
                                                                                                                                                                                                                                                    236
                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.
```

δÃ

534

```
RESULT

OPITHE

OPITHE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                        δδ
                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                 δÕ
                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                      δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                    Š
                                                       В
                                                                                               ð
                                                                                                                                        Вþ
                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE 20175756; PubMed=10710308;

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti

A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

B Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

B Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

A Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).

R EMBL: AFF25382; AAFF25311; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q9JPR9;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Science 2
EMBL; AF2
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9JPR9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             117
                        470
                                                              417
                                                                                                     411
                                                                                                                                            357
                                                                                                                                                                                351
                                                                                                                                                                                                                       297
                                                                                                                                                                                                                                                               291
                                                                                                                                                                                                                                                                                                        237
                                                                                                                                                                                                                                                                                                                                           231
                                                                                                                                                                                                                                                                                                                                                                                   177
                                                                                                                                                                                                                                                                                                                                                                                                                        171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \vdash
                                                                                                                                                                                                                   VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                   TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                          PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                               ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                   TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                             NTNENTNESSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                      ASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity 91.5
51; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0 (TrEMBLrel. 15, 0 (TrEMBLrel. 15, 1 (TrEMBLrel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          91.2%;
91.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2738.5;
Pred. No. 1.2e
ll; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9095F8E31AD7C76D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sequence up
annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .2e-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     107;
25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Capecchi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   chi B.
Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ξ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   s;
                                                                                                 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       57
                      529
                                                          476
                                                                                                                                          416
                                                                                                                                                                                410
                                                                                                                                                                                                                       356
                                                                                                                                                                                                                                                          350
                                                                                                                                                                                                                                                                                                    296
                                                                                                                                                                                                                                                                                                                                         290
                                                                                                                                                                                                                                                                                                                                                                              236
                                                                                                                                                                                                                                                                                                                                                                                                                      230
                                                                                                                                                                                                                                                                                                                                                                                                                                                             176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4;
```

```
밁
                Q
                                          망
                                                            δÃ
                                                                                    DЪ
                                                                                                         Q
                                                                                                                                  뫄
                                                                                                                                                       Š
                                                                                                                                                                              В
                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-20175756; PubMed-10710308;

Pizza M., Scarlato V., Masignani V., Gluliani M.M., Arico' B.

Pizza M., Scarlato V., Masignani V., Gluliani M.M., Arico' B.

A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecci
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., I
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuc
A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter
A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter
A Moxon E.R., Grandi G., Rappuoli R.;
Tidentification of Vaccine Candidates Against Serogroup B
T Meningococcus by Whole-Genome Sequencing.";
L Science 287:1816-1820(2000).

R EMBL; AF226359; AAP42508.1; -. 63662877787878
                                                                                                                                                                                                                                                                                                                              Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9JPT0;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OUTER |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis.
Bacteria; Proteobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-2996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPT0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 477
357
                    351
                                          297
                                                                  291
                                                                                       237
                                                                                                              231
                                                                                                                                    177
                                                                                                                                                         171
                                                                                                                                                                                117
                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              590
                                                                                                                                                                                                                            58
                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                              μ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       12
                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
|||||||||||||||| : ::||
MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD---DDDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8=8
                                                                                                                                                                                                                         ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                      GKDKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNVTF
                                                                                       GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVT
                                                                                                  GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                  TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                              -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VGSKDTNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNALAGIAQAIATAG
ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEMBRANE
                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Proteobacteria;
                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                            AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROTEIN
                                                                                                                                                                                                                                                                                                                                                                            62763 MW;
                                                                                                                                                                                                                                                                                                                              90.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15, Created)15, Last sequence update)16, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       beta
                                                                                                                                                                                                                                                                                                                  13;
                                                                                                                                                                                                                                                                                                                  Score 2725.5;
Pred. No. 4.3e
13; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                           63A6A3BD7F0F2EE3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subdivision; Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                598
                                                                                                                                                                                                                                                                                                                  .5; DB 2;
4.3e-107;
hes 27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₿
                                                                                                                                                                                                                                                                                                                                         2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        E., Capecchi
                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tettelin H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Zuo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В.
                                                                                                                                                                                                                                                                                                                   15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Chi B.
Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ₽.,
                                                                                                                                                                                                                                                                                                                                                                                                                                               <u>ن</u>
                                                                                                                                                                                                                                                                                                                  Gaps
                    410
                                                                                                                                                         230
                                                                                                                                                                                                     170
                                                                                                                                                                                                                            116
                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                        57
                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  536
                                           356
                                                                 350
                                                                                       296
                                                                                                              290
                                                                                                                                    236
                                                                                                                                                                                176
                                                                                                                                                                                                                                                                                                                  4.
```

```
Q PARESULT POOL OF THE POOL OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                 QY
                                                                                                                                                В
                    Ş
                                                               В
                                                                                                                                                                                                                                                                                                                            Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-NGH15;
MEDLINE-20175756; PubMed-10710308;
MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nu Patti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-OCT-2000
01-OCT-2000
01-DEC-2001
OUTER MEMBRA
GNA992 OR NH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9JPS0;
Q9JPS0;
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                             "Identification and characterization of a gene enc membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ datal EMBL; AF226381; AAF42530.1; -. SEQUENCE 598 AA; 62763 MW:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       417
                                                                                                          121
                        171
                                                               117
                                                                                                                                                                                                                                                                                                                              Local Similarity 91.
                                                                                                                                                     58
                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13
                                                                                                                                                                                                                                                                                   \vdash
                                                                                                                                                                                                                                                                                                                                                                         Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     - g
                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                       YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                            YLEPVQRTAVVLSFRSDKEGTGEKEGTED
                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD----DDDL
                    TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEMBRANE PROTEIN
591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                     90.8%;
91.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . 15, Created)
. 15, Last sequence update)
. 19, Last annotation updat
. GNA992 (NHHA OUTER MEMBRAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      beta
                                                                                                                                                                                                                                                                                                                                12;
                                                                                                                                                                                                                                                                                                                                     Pred. No. 4.3e-107;
2; Micmatal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                          E6C7AEF0BB8A63CB CRC64;
                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                       -SNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R., Jennings
encoding a r
                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Venter C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria
                                                                                                                                                                                                                                                                                                                                  15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Nuti
uo P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ή.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  s:,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 529
                                                                                                            170
                                                                                                                                                       116
                                                                                                                                                                                                  120
                                                                                                                                                                                                                                             57
                                                                                                                                                                                                                                                                                        60
                                                                   176
                                                                                                                                                                                                                                                                                                                                  4:
```

```
Q9QY5
ID Q9
ID Q9
AC CP

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
밁
                                Qy
                                                                               В
                                                                                                               Qy
                                                                                                                                                              밁
                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                     Query
Best L
                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q93QY5;
Q93QY5;
01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                Peak I.R., Srikhanta Y., Dieckelman M., Moxon R "Identification and characterization of a gene membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ d. EMBL; AR157603; AAK68864.1; -. SEQUENCE 598 AA; 62687 MW; 18CEFFE6410A15DF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-BZ10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NHHA OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           590
177
                                        171
                                                                                 117
                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                  hes 546;
                                                                                                                                                                 83
                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        14
                                                                                                                                                                                                                                                    ш
                                                                                                                                                                                                                                                                                         -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                              ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ę
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \tt GKGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                     TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                               NTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                 YLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKAGDNLKIKQ
                                                                                                                                                                                  YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    598
                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01 (TrEMBLrel. 19, 0
01 (TrEMBLrel. 19, 1
01 (TrEMBLrel. 19, 1
R MEMBRANE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                       NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                       90.5%;
90.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   beta
                                                                                                                                                                                                                                                                                                                                    13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Last
Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Created)
                                                                                                                                                                                                                                                                                                                                  Score 2716.5; DB 2
Pred. No. 1e-106;
3; Mismatches 28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sequence update)
annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    databases
                                                                                                                                                                                                                                                                                                                                                                             2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                         CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jennings
                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          מ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria.
                                                                                                                                                                                                                                                                                                                                        15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .
.
                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           416
                                                                                                                                                                       116
                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                         57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   290
                                                                                        176
```

4:

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
   Query Match
Best Local Similarity
Matches 538; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                         Q9JPR8 PRELIMINARY; PRT; 599 AA.
Q9JPR8;
Q1-OCT-2000 (TrEMBLrel. 15, Created)
Q1-OCT-2000 (TrEMBLrel. 15, Last sequence update)
Q1-DEC-2001 (TrEMBLrel. 19, Last annotation update)
QUTER MEMBRANE PROTEIN GNA992 (NHHA OUTER MEMBRANE
GNA992 OR NHHA.
                                                                                                                                                                                          MEDLINE-20175756; PubMed-10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffrles A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).
                                                              Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings "Identification and characterization of a gene encoding a rmembrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF226383; AAF42532.1;
EMBL; AF157608; AAK68869.1;
EMBL; AF157608; AAK68869.1;
BBA16EBF53C1970C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                       STRAIN-H38;
                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                          STRAIN-NGH38;
                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    오:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           598
   Conservative
               89.4%;
                                                                                                                                                                                                                                                                                                                                                                                         beta
   16;
Score 2685; Di
Pred. No. 2.2e
16; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                          subdivision;
  DB 2;
2.2e-105;
es 34;
                                                                                                                                                                                                                                                                                                                                                                                          Neisseriaceae;
                          Length
   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                              PROTEIN).
                                                                                                                                 novel outer
                                                                                                                                           3
                                                                                                                                                                                                                                                                                                                                                                                          Neisseria.
   14;
  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              290
   4.
```

```
В
         Ωy
                     В
                               δÃ
                                            밁
                                                      8
                                                                  В
                                                                            QΥ
                                                                                         В
                                                                                                   Qy
                                                                                                                밁
                                                                                                                          Qy
                                                                                                                                      B
                                                                                                                                                Ş
                                                                                                                                                             밁
                                                                                                                                                                       8
                                                                                                                                                                                    멍
                                                                                                                                                                                             Ωy
                                                                                                                                                                                                           В
                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                 В
                                             478
                                                       470
                                                                   418
                                                                              411
                                                                                                                                                              178
                                                                                                                                                                         171
598
          590
                      538
                                 530
                                                                                          358
                                                                                                     351
                                                                                                                298
                                                                                                                           291
                                                                                                                                       238
                                                                                                                                                  231
                                                                                                                                                                                    118
                                                                                                                                                                                                121
                                                                                                                                                                                                           60
                                                                                                                                                                                                                      61
                                                                                                                                                             오
          S.
                     PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDG-DALN
                                                                                          ASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                               ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                      GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                          PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDKGALN
          591
                                                        529
                                                                              469
                                                                                          417
                                                                                                     410
                                                                                                                            350
                                                                                                                                                                                     177
                                                                                                                                                                                                170
                                                                                                                                                                                                           117
                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                  59
                                 589
                                             537
                                                                   477
                                                                                                                357
                                                                                                                                       297
                                                                                                                                                   290
                                                                                                                                                             237
                                                                                                                                                                         230
```

Search completed: July 3, 2002, 08:28:37 Job time: 1158 sec

20

MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL

```
Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                 Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence:
                                                                                                                                                                                                                                                             NO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             on:
                                                                                                                                                                                                                                                                                                                                                              Pred. No. is the score greater to and is derived
                                                                                                                                                                                                                                                             Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              seq
                                                                                                                                                                                                                      2987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              length: 0
length: 2000000000
      100.0
100.0
93.0
91.8
90.4
89.3
89.3
89.3
89.3
                                                                                                                                                                                                                                                             Match
                                                                                                                                                                                                                                                                                                                                                              is the number of results predicted by chance to have a ter than or equal to the score of the result being printed, ived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A_Geneseq_032802:*

1. /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1980.DAT:*

2. /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1981.DAT:*

3. /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1982.DAT:*

4. /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1983.DAT:*

5. /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1985.DAT:*

5. /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1985.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           July 3, 2002, 08:09:01; Search time 168.6 Seconds (without alignments) 390.010 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   747574 seqs, 111073796 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-771-382-2
2987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVAVS.....TASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1988.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1989 DAT: *
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1990 DAT: *
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1991 DAT: *
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1991 DAT: *
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1993 DAT: *
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1993 DAT: *
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1994 DAT: *
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1995 DAT: *
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1997 DAT: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1986.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1987.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                            /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1999.DAT:
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA2000.DAT:
/SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA2001.DAT:
                                                                                                                                                                                                                                                             Length
        5999
5999
5999
5999
5994
5994
                                                                                                                                                                                                                                                             DB
          2222222222
                                                                                                                                                                                                                                                             Ħ
      AAY23744
AAU061172
AAU061180
AAY27203
AAY23743
AAY23747
AAU06176
AAY23747
AAU06179
AAY23738
                                                                                                                                                                                                                                                                                                                        SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           747574
N. meningitidis H4
N. meningitidis Z2
Amino acid sequenc
A surface protein
N. meningitidis H3
A surface protein
N. meningitidis H1
A surface protein
N. meningitidis BZ
A surface protein
                                                                                                                                                                                                                                                           Description
                                                                                                                                                                                                                  surface protein
```

0, 4-	ω	.~	_	٦	•	w	7	Ų,	٠,	_	~	٠٠	_	_	_	ω	7	٠,	٠.	_	w	٠٠	_	_	_	ω	7	٠,	٠,	_	~		
383.5	391	580	663	663	712	732	887	945.5	945.5	1014	1033	1116	1146	1869.5	2015.5	2216	2327	2407	2490.5	2490.5	2552	2552.5	2554.5	2554.5	2573.5	2573.5	2573.5	2581.5	2636	2636	2636	2658	
12.8	13.1	•	•	22.2		•	29.7	31.7	•	33.9	34.6	37.4	38.4	•	67.5	•	77.9	80.6	83.4	83.4	85.4	•	•	85.5	•	•	86.2	•	•	•	88.2	89.0	
1992	2053	116	1104	1104	1004	1002	245	679	679	1098	1094	2411	2353	407	433	604	502	512	589	589	592	513	591	591	591	591	591	591	594	594	594	598	
17	22	21	21	21	21	21	20	21	17	17	21	21	17	22	22	22	22	22	22	20	20	22	22	20	22	20	20	21	22	21	20	22	
AAE00701 AAW04505	AAB69135	AAB37832	AAB23859	AAB23856	AAB23857	AAB23854	AAY27201	AAB23855	AAR99394	AAR99392	AAB23858	AAB23860	AAR99393	AAU06184	AAU06185	AAU06181	AAU06186	AAU06182	AAU06173	AAY23745	AAY23737	AAU06183	AAU06175	AAY23741	AAU06171	AAY23746	AAY27202	AAY57045	AAU06174	AAY57044	AAY23740	AAU06178	
Moraxella catarrna Moraxella 200 kDa		Neisserial conserv	Haemophilus influe	Haemophilus influe	Haemophilus influe	Haemophilus influe	Amino acid sequenc	Haemophilus influe	Haemophilus adhesi		Haemophilus influe			۳.	N. meningitidis PM	N. meningitidis su'	N. meningitidis PM		N. meningitidis P2	A surface protein	A surface protein	N. meningitidis H4	N. meningitidis EG	A surface protein	۳.	A surface protein	Amino acid sequenc	BASB029 amino acid	N. meningitidis EG	nino ac	A surface protein	N. meningitidis BZ	

## ALIGNMENTS

A surface protein of Neisseria meningitidis

08-SEP-1999 (first entry)

AAY23744;

AAY23744 standard; Protein; 592

ĄΑ

Neisseria meningitidis surface proteins useful for treating meningitidis infections  $\begin{tabular}{ll} \end{tabular} \label{table_equation}$ Surface protein; surface glycoprotein; infection; vaccine; immunoreactive peptide. WPI; 1999-418754/35. N-PSDB; AAX85796. Jennings MP, (ISIS-) ISIS INNOVATION LTD. 12-DEC-1997; 14-DEC-1998; 24-JUN-1999. WO9931132-A1 Neisseria meningitidis. Moxon 97GB-0026398 98WO-AU01031 ER, Peak IRA;

```
RESULT
AAU06172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
      밁
                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to the form of vaccines.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim
                                                                                                                               AAU06172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
Neisseria meningitidis
                                                       N. meningitidis
                                Surface antigen NhhA; meningococcal
                                                                                                                                                                                             541
                                                                                                                                                                                                                    541
                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    used to
                                                                                                                                                      N
                                                                                                                                                                                                                                                                                                                                                                                          GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                       RITHVAPGVKEGDVTHVAQLKGVAQNLHNRIDHVNGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                              VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \verb|gigstltdmllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgttasdnvdf|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mnkiyriiwnsalnawvavseltrnhtkrasatvktavlatllfatvqanatdedeeeel
                                                                                                                                                                                          MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                             ritnvapgvkegdvtnvaqlkgvaqnlnnridnvngnaragiaqaiataglvqaylpgks
                                                                                                                                                                                                                                                                                              ninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddegalnvgskdankpv
                                                                                                                                                                                                                                                                                                        NINAGNNIEITRNGKNIDIATSMTPQFSSYSLGAGADAPTLSYDDEGALNVGSKDANKPV
                                                                                                                                                                                                                                                                                                                                             skddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmdetv
                                                                                                                                                                                                                                                                                                                                                        SKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            esvqrsvvgsiqasmegsveletislsmtndskefvdpyivvtlkagdnlkikqntnent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Page 118-120; 132pp;
                                                                                                                                standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                               (first
                                                        H41 surface antigen
                                                                                                                                Protein;
                                                                                 entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                  592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2987; DB 2
No. 4e-163;
                                                        NhhA polypeptide sequence
                                 disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                                      480
                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
```

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen NhhA from N. meningitidis strain H41 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Peptide
(AAU06171-AAU06180)
the present invention
                                                                                                                                                                                                                                                                                                              Claim 9; Fig 1; 91pp;
                                                                                                                                                                                                                                                                                                                                                     preventing broad spectrum of Neisseria
                                                                                                                                                                                                                                                                                                                                                         New NhhA surface antigen polypeptides and polynucleotides
Neisseria meningitidis, useful in producing vaccines for i
preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          02-AUG-2001.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        25-JAN-2000;
  present invention
                                                                                                                                                                                                                                                                                                                                                                                                                                         2001-488774/53.
)B; AAS09162.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note=
51..102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label= C2
/note= "Conserved region
115..124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= V4
/note= "Variable
237..592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label= V3
/note= "Variable
211..229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "Variable region
52..592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               230..236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= C4
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label= C3
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Variable
125..188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label= Mature_NhhA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .210
                                                                                                                                                                                                                                                                                                                English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Predicted mature protein, specifically claimed in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Signal_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ٧2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ٧3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2
                                                                                                                                                                                                                                                                                                                                                                               treating
                                                                                                                                                                                                                                                                                                                                                                                   or
P
```

Sequence

•,

```
RESULT
AAU06180
ID AAUC
Qy
                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                          QV
                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ρy
                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                           Key
Region
                                                                                                                                          Surface antigen NhhA; meningococcal
                                                                                                                                                              N. meningitidis
                                                                                                                                                                                                                      AAU06180 standard; Protein;
        Region
                                   Region
                                                                                                                        Neisseria
                                                                                                                                                                                 24-OCT-2001
                                                                                                                                                                                                    AAU06180;
                                                                Region
                                                                                                                                                                                                                                                                                      541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                  RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                              ninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddegalnvgskdankpv
                                                                                                                                                                                                                                                                                                                                                        NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPV
                                                                                                                                                                                                                                                                                                                                                                                   skddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmdetv
                                                                                                                                                                                                                                                                                                                                                                                              SKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                                                   TDEGEGLYTAKEYIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTFASGNGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                              vrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgklvtgkgkgengss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mnkiyriiwnsalnawvavseltrnhtkrasatvktavlatllfatvqanatdedeeeel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                   mmaigggtylgeagyaigyssisaggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                        ritnvapgvkegdvtnvaqlkgvaqnlnnridnvngnaragiaqaiataglvqaylpgks
                                                                                                                                                                                                                                                                                                                                                                                                                         tdegeglvtakevidavnkagwrmktttanggtggadkfetvtsgtkvtfasgngttatv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                        meningitidis strain 22491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                (first entry)
                                                               /label= C1
/note= "Conserved region
51..102
                                                                                                                                                              Z2491
       /note= "Conserved region 115..124
                           /label=
                                     103..114
                                                      /label=
                                                                                                     Location/Qualifiers
                                              /note≖ "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100.0%;
                                                                                                                                                            surface antigen NhhA polypeptide sequence.
                             C2
                                                         _
                                                                                                                                                                                                                      592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2987; DB 2
Pred. No. 4e-163;
                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                              region
                                                                                                                                          disease; meningitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                           vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                            540
                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
```

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhAA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than
                                                                                                                                                                                                                                                                                                        WPI; 200
N-PSDB;
                                                                                                                                                                                                                                                                                                                                                Peak
Sequence
                                                                                                                                                                                                                            Claim 9;
                                                                                                                                                                                                                                                  New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                    would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain 22491 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                         OQYU)
                                                                                                                                                                                                                                                                                                                                                                                                   25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                              25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                        2001-488774/53.
DB; AAS09170.
                                                                                                                                                                                                                                                                                                                                                                        ) UNIV QUEENSLAND
                                                                                                                                                                                                                          Fig 1; 91pp;
592
                                                                                                                                                                                                                                                                                                                                                                                                     2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= V4
/note= "Variable :
237..592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= V3
/note= "Variable
209..227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "125..188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          189..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "Conserved
228..236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note- "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           . 208
                                                                                                                                                                                                                         English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2
```

or P

```
δÃ
            Ş
                           뫄
                                                     DЪ
                                                                  Š
밁
                                                                                Matches
                                                                                      Query Match
Best Local
 121
             121
                                                                                       Local Similarity
                           61
                                        61
                                                      ш
                                                                  ۱
                                                           MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
mnkiyriiwnsalnawvavseltrnhtkrasatvktavlatllfatvqanatdedeeeel
                                                                                 Conservative
                                                                                      93.0%;
                                                                                 9;
                                                                                      Score
Pred.
                                                                                 Mismatches
                                                                                      2779;
No. 3.
                                                                                 DB 22;
1.2e-151;
1es 23;
                                                                                              Length
                                                                                 Indels
                                                                                 4.
                                                                                 Gaps
 180
             180
                                                      60
                                                                   60
```

2;

181

GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--SDNV

```
RESULT ANY STATE OF A PARTY STATE OF A P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         09-OCT-1998;
14-JAN-1998;
01-SEP-1998;
The invention provides proteins (AAY27201-245) from Neisseria meningitidis (Strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g. a vaccine composition or a diagnostic composition. The composition is also useful for treating or preventing an infection due to Neisserial backeria, especially Neisseria meningitidis.
                                                                                                                                                                                                                                 New protein and its nucleotide sequence, diagnostic compositions for treating and meningitidis infections
                                                                                                                                                                                        Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            22-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY27203;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAY27203
                                                                                                                                                                                                                                                                                                                                                                                                                                            (CHIR-) CHIRON SPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14-JAN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WO9936544-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bacterial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4
                                                                                                                                                                                                                                                                                                                               1999-444400/37.
DB; AAX99125.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTFASGNGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     {\tt sstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkgtta}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               dfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkgkgeng
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     acid
                                                                                                                                                                                                                                                                                                                                                                                                  G, Masignani
                                                                                                                                                                                        Page 63; 123pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   meningitidis protein;
infection; treatment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sequence of N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98GB-0022143.
98GB-0000760.
98GB-0019015.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99WO-IB00103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry]
                                                                                                                                                                                                                                                                                                                                                                                                  <
                                                                                                                                                                                                                                                                                                                                                                                                  Pizza
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                  ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      pharmaceutical;
                                                                                                                                                                                                                                                                                                                                                                                             Rappuoli
                                                                                                                                                                                                                                                           and/or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein
                                                                                                                                                                                                                                                        useful in vaccines or
/or preventing Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                  æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORF40a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                  Scarlato
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         238
```

```
RESULT

AAY23743

ID AAY2

XX AAY2

XX AAY2

XX AAY2

XX AAY2

XX Surf

KW Surf

KW Surf

KW immu

XX Neis

XX Neis

XX Nes

XX 12-1

PD 24-:

XX XX 12-1

PF 14-1-1

XX 15-1

PA (15:
                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                QУ
                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                       QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sox
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                               Surface
                                                                                                                                A surface
                                                                                                                                                  08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                 12-DEC-1997;
                                  14-DEC-1998;
                                                                                     Neisseria meningitidis
                                                                                                      Surface protein; immunoreactive p
                                                                                                                                                                   AAY23743;
                                                                                                                                                                                   AAY23743
                                                                                                                                                                                                                                                               479
                                                                                                                                                                                                                             539
                                                                                                                                                                                                                                              539
                                                                                                                                                                                                                                                                               479
                                                                                                                                                                                                                                                                                                419
                                                                                                                                                                                                                                                                                                                  419
                                                                                                                                                                                                                                                                                                                                   359
                                                                                                                                                                                                                                                                                                                                                   359
                                                                                                                                                                                                                                                                                                                                                                     299
                                                                                                                                                                                                                                                                                                                                                                                      299
                                                                                                                                                                                                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Н
                                                                                                                                                                                                   Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                               DFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENG
                                                                                                                                                                                                                                                                                                                                                                                                                                        gigstltdtl--agssashvdagnxsthytraasikdvlnagwnikgvkxgsttgqsenv
                                                                                                                                                                                                                                                                                                                                                                                                                                                 GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--SDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN 180
                                                                                                                                                                                                                                                                                                                                                                             SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTA
                                                                                                                                                                                                                                                                                                                                                                                                      dfvrtydtveflsadtxtttvnveskdngkrtevkigaktsvikekdgklvtgkgkgeng
                                                                                                                                                                                                                                                                                                                                 tvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmde
                                                                                                                                                                                                                                                                                                                                                                    sstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkgtta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                   standard;
                                                                                                                               protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                 (first
                                                                                                      n; surface
peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A
                  97GB-0026398
                                  98WO-AU01031
                                                                                                                               of Neisseria meningitidis.
                                                                                                                                                                                   Protein;
                                                                                                                                                entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       91.8%;
92.9%;
                                                                                                              glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10;
                                                                                                                                                                                   599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2743; DB 20;
Pred. No. 3.6e-149;
.0; Mismatches 28;
                                                                                                                                                                                   A
                                                                                                                infection;
                                                                                                                vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                             592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                 478
                                                                                                                                                                                                                                                                                                                                                   418
                                                                                                                                                                                                                                                                                                                                                                                      358
                                                                                                                                                                                                                                                                                                                                                                                                                                                          238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                               538
                                                                                                                                                                                                                                                                                                                                                                    358
                                                                                                                                                                                                                                                                                                                                                                                                       298
                                                                                                                                                                                                                                                                                                                                                                                                                        298
                                                                                                                                                                                                                                                                                                                                                                                                                                         238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
```

(ISIS-) ISIS

INNOVATION LTD

÷

```
RESULT
AAU06176
ID AAU0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best Local Similarity Matches 547; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1999-418754/35.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (UYQU)
                                                                      540
                                                                                              533
                                                                                                                          480
                                                                                                                                                     473
                                                                                                                                                                                420
                                                                                                                                                                                                            413
                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                 353
                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                       293
                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                                                                                           233
                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                  173
                                                                                                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ш
                            6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTFAS
                                                                                                                                                                                                                                                                                                                                                                                                  QAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                    SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLV
                                                                                                                                                                           TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                          nkntnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketagtn\\
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --NTNENTNASSETYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 epvvrsalvlqfmidkegngenestgnigwsiyydnhntlhg-atvtlkagdnlkikqnt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ESVORS-VVGSIQASMEGSVELET---ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQ--
                                                                                                                        skdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglv
                                                                     qaylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAX85795
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ΜÞ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   114-115;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       90.48; 91.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2699.5; DB 20
Pred. No. 1.1e-146;
1; Mismatches 33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            useful for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                              592
                                                                                                                                                                                479
                                                                                                                                                                                                                                    419
                                                                                                                                                                                                                                                              412
                                                                                                                                                                                                                                                                                                                                                299
                                                                                                                                                                                                                                                                                                                                                                                                                               232
                                                                                                                                                                                                                                                                                                                                                                                                                                                            179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                    532
                                                                                                                                                                                                          472
                                                                                                                                                                                                                                                                                           359
                                                                                                                                                                                                                                                                                                                     352
                                                                                                                                                                                                                                                                                                                                                                          292
                                                                     599
                                                                                                                        539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4.
```

В Q Вр δÃ 밁 δÃ 밁 Ş Ъ δÃ B δõ В ρy 밁 Ş

or C

В δÃ 밁 δÃ

AAU06176 standard;

Protein; 599

Å

```
The present invention relates to the isolation of nove.....

meningitidis mutant polypeptides of the surface antigen NhhA
(AAU06182-AAU06186). The modified or mutant NhhA polypeptides are
characterised by deletions of non-conserved amino acids, particularly
the deletion of variable regions. The deletion mutants are useful in
diagnostics, therapeutic and prophylactic vaccines against a broader
spectrum of N. meningitidis, and in designing and/or screening of
medicaments. The mutant proteins when used as a vaccine can effectively
immunise against a broader spectrum of N. meningitidis strains than
would be expected from a corresponding wild-type surface antigen NhhA
The present sequence representing the wild type surface antigen NhhA
                                                                                                                                                                                                                                                               Claim 9;
                                                                                                                                                                                                                                                                                               New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                              Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N. meningitidis H38
                                                                                                                                                                                                                                                                                             preventing broad
                                                                                                                                                                                                                                                                                                                                                                       N-PSDB; AAS09166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25-JAN-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Surface antigen NhhA; meningococcal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAU06176;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                              IRA,
                                                                                                                                                                                                                                                                                                                                                                                            2001-488774/53
                                                                                                                                                                                                                                                           Fig 1; 91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                             Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note= "Conserved 237..243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Conserved
196..217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    218.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        244..599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         106..117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               132..195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18..133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                surface antigen NhhA polypeptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    236
                                                                                                                                                                                                                                                             English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ٧4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ٧3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۷2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence
                                                                                                                                                                                                                                                                                                                    treating
```

```
RESULTY
AAX23747
AAX23742
ID AAX2
XX AAX2
AC AAX2
XX OB-S
XX SUT
DE A SU
XX SUT
KW Immu
XX Neis
PN WO99
XX WO99
XX 14-1
XX 14-1
XX 14-1
XX 14-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           32 X C C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
Matches 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (AAU06171-AAU06180) from the present invention.
12-DEC-1997;
                                                                                                                         Surface
                                                                                        Neisseria meningitidis
                                                                                                               immunoreactive
                                                                                                                                                                    08-SEP-1999
                                                                                                                                                                                                            AAY23742 standard;
                           14-DEC-1998;
                                                24 - JUN - 1999
                                                                                                                                                                                                                                                                  540
                                                                                                                                                                                                                                                                                       533
                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                 473
                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                           413
                                                                                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            115
                                                                                                                                                                                                                                                                                                                                                                                                                     353
                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         233
                                                                                                                                                                                                                                                                                                                                                                                                                                                               293
                                                                                                                                              surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \vdash
                                                                                                                                                                                                                                  7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --NTNENTNASSETYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                           QAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                 KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                              SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nkntnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketagtn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ESVQRS-VVGSIQASMEGSVELET---ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          mnkiyriiwnsalnawvavseltrnhtkrasatvktavlatllfatvqanatdedeeeel
                                                                                                                                                                                                                                                                                                           skdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglv
                                                                                                                                                                                                                                                                                                                                                                                                                                         gkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                epvvrsalvlqfmidkegngenestgnigwsiyydnhntlhg-atvtlkagdnlkikqnt
                                                                                                                                                                                                                                                                 qaylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                                                                     kgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddkgalnvg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      al Similarity
547; Conser
                                                                                                                        protein;
                                                                                                                                             protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                              peptide
     97GB-0026398
                            98WO-AU01031
                                                                                                                        surface glycoprotein;
                                                                                                                                              of Neisseria
                                                                                                                                                                                                             Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               90.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Score 2699.5; DB 2
; Pred. No. 1.1e-146;
11; Mismatches 33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        different N. meningitidis strains given
                                                                                                                                                                                                               598
                                                                                                                                              meningitidis
                                                                                                                                                                                                               3
                                                                                                                         infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω
3
;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                           472
                                                                                                                                                                                                                                                                                                                                                                                                419
                                                                                                                                                                                                                                                                                                                                                                                                                     412
                                                                                                                                                                                                                                                                                                                                                                                                                                         359
                                                                                                                                                                                                                                                                                                                                                                                                                                                              352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.
```

```
Вþ
                                                                                                  δÃ
                                                                                                                         맑
                                                                                                                                            Qy
                                                                                                                                                                       B
                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                  р
                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be useful.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (ISIS-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           in
be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 prevent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 1; Page 108-110; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis : meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Jennings MP,
                                                                                                                          413
                                                                                                                                                 407
           587
                                  533
                                                                              473
                                                                                                   467
                                                                                                                                                                       353
                                                                                                                                                                                             347
                                                                                                                                                                                                                   293
                                                                                                                                                                                                                                         287
                                                                                                                                                                                                                                                               233
                                                                                                                                                                                                                                                                                     227
                                                                                                                                                                                                                                                                                                             173
                                                                                                                                                                                                                                                                                                                                  167
                                                                                                                                                                                                                                                                                                                                                         113
                                                                                                                                                                                                                                                                                                                                                                              111
                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          e N. meningitidis surface glycoproteins can also be used to event or treat N. meningitidis infection in humans, especially the form of vaccines. The proteins and antibodies can also used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                       KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK 166
SVGYQW
                                                                                                                                                                                                                                                             1999-418754/35
                              GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAI
                                                                                                                                      GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                    KYTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                  klvtgkgkdengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgt
                                                                                                                                                                                                                              KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                          epvqrtavvlsfrsdkegtgekeg-----tedsnwav--yfdekrvlkagaitlkagdnl
                                                                                                                                                                                                                                                                                                                                                                                                                           ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI------VVTLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                 mnkiyriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd-dddlyl
                                                                                                                         gnvspskgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvdde
                                                                                                                                                                                                                                                                                                                                  ETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                             galnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqai
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ISIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                  =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2667; DB 20;
Pred. No. 8.1e-145;
0; Mismatches 30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                       112
                                                                                                     526
                                                                                                                                                 466
                                                                                                                                                                       412
                                                                                                                                                                                              406
                                                                                                                                                                                                                                          346
                                                                                                                                                                                                                                                                                                             232
                                                                                                                                                                                                                                                                                                                                   226
                                                                                                                                                                                                                                                                                                                                                                                                                                                   59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                               532
                                                                                                                            472
                                                                                                                                                                                                                     352
                                                                                                                                                                                                                                                                  292
                                                                                                                                                                                                                                                                                      286
```

RESULT AAU06177

8

В

593

svgyqw

598

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA meningitidis mutant polypeptides are (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in
                                                                                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N. meningitidis
the deletion of variable diagnostics, therapeutic
                                                              Claim
                                                                            New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                          Peak IRA,
                                                                                                                                                            ODYU)
                                                                                                                                                                              25-JAN-2000;
                                                                                                                                                                                              25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                  WO200155182-A1
                                                                                                                                                                                                                                                                      Regior
                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU06177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU06177 standard;
                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                 2001-488774/53
DB; AASO9167.
                                                                                                                                                            ) UNIV QUEENSLAND
                                                              9
                                                            Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meningitidis strain H15.
                                                                                                                                          Jennings
                                                                                                                                                                              2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NhhA; meningococcal
                                                                                                                                                                                                                                                                     /note=
243..5
                                                                                                                                                                                                                                                                                               /note=
236..2
                                                                                                                                                                                                                                                                                                                         /note= "Variable region 217 .235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  H15
                                                                                                                                                                                                                                                                                                                                                  /note= "Conserved
195..216
                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Conserved
117..130
                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "Variable 105..116
                                                                                                                                                                                                                                                                                      /label=
                                                                                                                                                                                                                                                                                                                /label=
                                                                                                                                                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= v1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label=
                                                                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                                                                                                     /label=
                                                                                                                                                                                                                                                                                                                                                                                     note= "Variable"
                                                                                                                                                                                                                                                                                                                                                                                               -Tabet
                                                                                                                                                                                                                                                                                                                                                                                                                         /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein;
                                                                                                                                           ΜP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 surface antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entry)
                                                                                                                                                                                                                                                                                                                                                                             . 194
                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                . 242
                                                                                                                                                                                                                                                                             "Variable
                                                                                                                                                                                                                                                                                                       "Conserved region
                                                                                                                                                                                                                                                   "Conserved
                                                                                                                                                                                                                                                                                        ٧4
                                                                                                                                                                                                                                                                                                                  ç
                                                                                                                                                                                                                                                                                                                                                                      C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ្ឋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A
                                                                                                                                                                                                                                                                             region
                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                           region
                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NhhA polypeptide sequence
                                                                                                                                                                                                                                                    Ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               meningitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                vaccine
                                                                                      treating
                                                                                               from
                                                                                       ő
```

prophylactic

RESULT AAY23739 ID AAY2 XX AC AAY2 XX DT 08-S XX DE A Su XX KW Surf KW inmu

08-SEP-1999 AAY23739

(first

entry)

surface

protein

0f

Neisseria meningitidis. glycoprotein;

infection; vaccine,

AAY23739 standard;

Protein; 594

₿

9

Surface protein; surface immunoreactive peptide.

peptide

```
99999999×8
                                                                                                         Ş
                                                                                                                                                                           В
                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                  Ş
                                          В
                                                               δõ
                                                                                     밁
                                                                                                                               밁
                                                                                                                                                    Ş
                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches 544;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain H15 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the present invention.
 593
                     587
                                           533
                                                                 527
                                                                                     473
                                                                                                           467
                                                                                                                                 413
                                                                                                                                                       407
                                                                                                                                                                            353
                                                                                                                                                                                                 347
                                                                                                                                                                                                                      293
                                                                                                                                                                                                                                                                  233
                                                                                                                                                                                                                                                                                       227
                                                                                                                                                                                                                                                                                                            173
                                                                                                                                                                                                                                                                                                                                                       113
                                                                                                                                                                                                                                                                                                                                                                            111
                                                                                                                                                                                                                                            287
                                                                                                                                                                                                                                                                                                                                  167
                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                           svgyqw 598
                    SVGYQW
                                         at a glaqaylpgks \verb|mmaigggtyrgeagyaigyssisdtgnwvikgtasgnsrghfgasa|
                                                     ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA
                                                                                               GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                            ESVQR-SVVGSIQASMEGSVELETISLSMINDSKEFVDPYI------VVTLKAGDNL 110
                                                                                     galnvgskdankpvrítnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqai
                                                                                                                                                                           kvtfasgngttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvis
                                                                                                                                                                                     KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                    \verb+kikqntnentnessftyslkkdltdltsveteklsfgangnkvnitsdtkglnfak+
                                                                                                                                                                                                                                                                                                                                                                            KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK
                                                                                                                                                                                                                                                                                                                                                                                                 epvqrtavvlsfrsdkegtgekeg----tedsnwav--yfdekrvlkagaitlkagdnl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             598
                     592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2667;
No. 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 22;
3.1e-145;
nes 30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                   112
                                                                                                           526
                                                                                                                                 472
                                                                                                                                                       466
                                                                                                                                                                            412
                                                                                                                                                                                                  406
                                                                                                                                                                                                                                                                                                             232
                                                                                                                                                                                                                                                                                                                                                       172
                                                                                                                                                                                                                                                                                                                                                                             166
                                                                                                                                                                                                                                                                                                                                                                                                                                             59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                           592
                                                                                     532
                                                                                                                                                                                                                       352
                                                                                                                                                                                                                                            346
                                                                                                                                                                                                                                                                  292
                                                                                                                                                                                                                                                                                                                                 226
                                                                                                                                                                                                                                                                                      286
```

```
Query Match
Best Local S
Matches 542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to the identify immurcatative continual.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (ISIS-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis surface proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis.
                                                                                                                                                                                                                                              173
   413
                                                                                                                                                                                   233
                                                                                                                                                                                                                231
                                                                                                                                                                                                                                                                        171
                                                                                                                                                                                                                                                                                                       113
                             411
                                                            353
                                                                                        351
                                                                                                                      293
                                                                                                                                                   291
                                                                                                                                                                                                                                                                                                                                   111
                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                        _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           used to
                                                                                                                                                                                                                                        PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN 470
                                                                                                                                  GKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1999-418754/35
                                                        KIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAG
                                                                                                                   gkgkdengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtf
                                                                                                                                                                                                                GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVK1GAKTSV1KEKDGKLVT
                                                                                                                                                                                                                                                                                                   \verb+kikqntnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketag
                                                                                                                                                                                                                                                                                                                                                               epvqrtavvlsfrsdkegtgekeg-----tedsnwav--yfdekrvlkagaitlkagdnl
                                                                                                                                                                                                                                                                                                                                                                                             ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      al Similarity
542; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ISIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Μ̈́P,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INNOVATION LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          95-97; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ā,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 89.2%;
90.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2664; D. Pred. No. 1.2e 9; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                           -----VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                        230
                                                                                                                                                                                                                                                                                                    172
                                                                                                                                                                                                                                                                                                                                                                                                                           59
                                                           412
                                                                                       410
                                                                                                                                                350
                                                                                                                                                                                 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5
```

Qy Вþ δÃ Db Qy 망 ρŞ Дb QΥ В Q DЬ Qy рЬ Q

밁

New NhhA surface antigen polypeptides and pone Neisseria meningitidis, useful in producing

polynucleotides from vaccines for treating

or C

```
RESULT 1
AAU06179
ID AAU0
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Бр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20
                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                Key
Region
                  N-PSDB;
                                                                                                                                                      Region
                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                    Neisseria
                                                                                                                                                                                                                                                                                                                                                            24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                         AAU06179;
                                                                                                                                                                                                                                                                                                                                                                                      AAU06179 standard; Protein; 594
                                                   (UYQU)
                                                                25-JAN-2000;
                                                                              25-JAN-2001;
                                                                                           02-AUG-2001
                                                                                                        WO200155182-A1
                                                                                                                                  Region
                                                                                                                                                                          Regior
                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                       593
                                                                                                                                                                                                                                                                                                                                                                                                                                                 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           473
                                                                                                                                                                                                                                                                                                                                                                                                                                   591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        471
                                                                                                                                                                                                                                                                                                                                              meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                   10
                  2001-488774/53
DB; AAS09169.
                                                                                                                                                                                                                                                                                                                                                                                                                      $=$
                                                                                                                                                                                                                                                                                                                                                                                                                                                      LVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                lvqaylpgksmmaiggdtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           vgskdtnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiatag
                                                   UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                    meningitidis strain
                                     Jennings
                                                                2000US-0177917
                                                                              2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                            (first entry)
                                                                                                                                  /label= V4
/note= "Variable
239..594
                                                                                                                                                                          /note= "
213..231
                                                                                                                                                                                                                                     /note=
117..1:
                                                                                                                                                                                                                                                         /note= "\
105..116
                                                                                                                                                                                                                                                                             /note= '51..104
                                                                                                                                                                                               /note= "0
                                                                                                                                                                                                                                                                                                                                              BZ198
                                                                                                                                                                                                                 /label= V2
/note= "Variable
127..190
                                                                                                                                                             /note=
                                                                                                                                                                    /label=
                                                                                                                                                                                        /label=
                                                                                                                                                                                                           /label-
                                                                                                                                                                                                                                                                       /label=
                                                                                                                                                                                                                                                                                                      ocation/Qualifiers
                                                                                                                      'note= "Conserved
                                                                                                                                                                                                                                      .126
                                                                                                                                                                                                                                                                                                                                 meningococcal
                                                                                                                                                                                                                                                                                                                                              surface
                                                                                                                                                             "Conserved
                                                                                                                                                                                 "Variable
                                                                                                                                                                                                                                                               "Variable
                                                                                                                                                                                                    "Conserved
                                                                                                                                                                                                                                           "Conserved
                                                                                                                                                                                                                                                                                  "Conserved region
                                                                                                                                                                                                                               ٧2
                                                                                                                                                                                                                                                    C2
                                                                                                                                                                                                                                                                       ⊻1
                                                                                                                                                                                                                                                                                          C
                                                                                                                             C5
                                                                                                                                                                     C4
                                                                                                                                                                                        ٧
                                                                                                                                                                                                           C3
                                                                                                                                                                                                                                                                                                                    BZ198.
                                                                                                                                                                                                                                                                                                                                              antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                      A
                                                                                                                                         region
                                                                                                                                                                                 region
                                                                                                                                                                                                                       region
                                                                                                                                                                                                                                                               region
                                                                                                                      region
                                                                                                                                                                                                                                            region
                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                 disease;
                                                                                                                                                                                                                         2
                                                                                                                                                                                                                                            Ŋ
                                                                                                                                                                                                                                                                                                                                 meningitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                             590
                                                                                                                                                                                                                                                                                                                                                                                                                                                 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           532
```

```
RESULT 1
AAY23738
                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρy
                                                                        Q
                                                                                                                          δõ
                                                                                                                                                        밁
                                                                                                                                                                               Š
                                                                                                                                                                                                         Db
                                                    밁
                                                                                                      ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches 542;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain BZ198 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           preventing
                                                    593
                                                                            591
                                                                                                      533
                                                                                                                               531
                                                                                                                                                         473
                                                                                                                                                                                  471
                                                                                                                                                                                                            413
                                                                                                                                                                                                                                     411
                                                                                                                                                                                                                                                               353
                                                                                                                                                                                                                                                                                         351
                                                                                                                                                                                                                                                                                                                  293
                                                                                                                                                                                                                                                                                                                                            291
                                                                                                                                                                                                                                                                                                                                                                    233
                                                                                                                                                                                                                                                                                                                                                                                                231
                                                                                                                                                                                                                                                                                                                                                                                                                          173
                                                                                                                                                                                                                                                                                                                                                                                                                                                   171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            μ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                present invention.
                                                                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                  ΨP
                                                                            ş
                                                                                                                LVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                    VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAG
                                                                                                                                                                                                     pskgkmdet vnin agnnieitrngknid i atsmapqfssvslg agadaptlsvdde galn\\
                                                                                                                                                                                                                       PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                                                                                                        ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                       ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI------VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mnkiyriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd-dddlyl
                                                                                                                                                                                                                                                            asgkgttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvs
                                                                                                                                                                                                                                                                                                                                                                                                                                                 TNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              epvqrtavvlsfrsdkegtgekeg----tedsnwav--yfdekrvlkagaitlkagdnl
                                                                                                                                                        vgskdtnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiatag
                                                    594
                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            broad
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           spectrum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                89.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 2664; DI
Pred. No. 1.2e
9; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; DB 22;
1.2e-144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    170
                                                                                                                                                                                                         472
                                                                                                                                                                                 530
                                                                                                                                                                                                                                   470
                                                                                                                                                                                                                                                             412
                                                                                                                                                                                                                                                                                      410
                                                                                                                                                                                                                                                                                                                352
                                                                                                                                                                                                                                                                                                                                          350
                                                                                                                                                                                                                                                                                                                                                                    292
                                                                                                                                                                                                                                                                                                                                                                                             290
                                                                                                                                                                                                                                                                                                                                                                                                                        232
                                                                                                                                                                                                                                                                                                                                                                                                                                                230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
```

```
Š
                                                                     밁
                                                                                                               Qy
                                                                                                                                                                   밁
                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       $\times \times \
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The present sequence meningitidis which is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VIND ( UQYU) SISI (-SISI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       24 - JUN - 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Surface protein;
immunoreactive p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAY23738 standard; Protein;
                                                                                                                                                                   173
                        287
                                                                                                                                                                                                                 167
                                                                                                                                                                                                                                                                113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local
                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
KLYTGKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                              ETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                       epvqrtavvlsfrsdkegtgekeg-----tedsnwav--yfdekrvlkagaitlkagdnl
                                                                                                                                                                                                                                                                                                                                                                                                      ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI------VVTLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                     mnkisriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd-dddlyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   542;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAX85790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Page 91-93; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protein of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 se represents a surface protein of Neiserria is approximately 62 kDa. The N. meningitidi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      89.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 2658;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; DB 20;
2.7e-144;
nes 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                             166
                                                                                                                                                                                                               226
                                                                                                                                                                                                                                                                172
                                                                                                                                                                                                                                                                                                                                                                                                                                                       59
                                                                                                                                                                     232
```

6;

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                         Key
Region
                                                                                                                                                                                                                                                                                                                                                    N. meningitidis
25-JAN-2000; 2000US-0177917
                 25-JAN-2001;
                                                                                   Regior
                                                                                                             Region
                                                                                                                                                              Region
                                                                                                                                                                                       Region
                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                    Neisseria
                                                                                                                                                                                                                                                                                                                                   Surface antigen NhhA; meningococcal
                                                                                                                                                                                                                                                                                                                                                                    24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                     AAU06178;
                                                                                                                                                                                                                                                                                                                                                                                                     AAU06178 standard; Protein;
                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  347
                                                                                                                                                                                                                                                                                                                                                                                                                                                593
                                                                                                                                                                                                                                                                                                                                                                                                                                                               587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   293
                                                                                                                                                                                                                                                                                                                                                                                                                     12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAI 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  klvtgkgkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                             svgyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                               SVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                galnvgskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqai
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gnvspskgkmdetvnin agnnie itrngknid i atsmtpqfssvslgagadaptlsvdde\\
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 kvtfasgngttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvis
                                                                                                                                                                                                                                                                                                                   meningitidis strain BZ10
                                                                                                                                                                                                                                                                                                                                                                                                                                                598
                  2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                    (first entry)
                                                                                                            /label= C4
/note= "Conserved
236..242
                                                                                                                                                                                                                                         /note= "\
105..116
                                                                                   /label= V4
/note= "Variable
243..598_
                                                                                                                                                               /label= C3
/note= "Conserved
195..216
                                                                                                                                                                                                                        /label= C2
/note= "Conserved
                                                                                                                                              /label= V3
/note= "Variable
                                                                                                                                                                                        /note= "Variable
131..194
                                                                                                                                                                                                       /label= V2
                                                                                                                                                                                                                                                          /label= V1
                                                                                                                                                                                                                                                                         /note= "Conserved region
                                                                                                                                                                                                                                                                                  /label= C1
                                                                                                                                                                                                                                                                                                 location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                    surface antigen NhhA polypeptide sequence.
                                                                                                                                                                                                                                                 "Variable region
                                                                   "Conserved region
                                                                            C5
                                                                                           region
                                                                                                                                              region
                                                                                                                                                                                               region
                                                                                                                                                                                                                        region
                                                                                                                    region
                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                   disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  412
```

```
QΥ
                                                          Вb
                                                                                   Ş
                                                                                                                                          Qy
                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                         B
                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain BZ10 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for the preventing broad spectrum of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (UYQU ) UNIV QUEENSLAND
  473
                             467
                                                          413
                                                                                    407
                                                                                                                                              347
                                                                                                                                                                                                                                                                                          173
                                                                                                                                                                                                                                                                                                                      167
                                                                                                                                                                                                                                                                                                                                                   113
                                                                                                                  353
                                                                                                                                                                           293
                                                                                                                                                                                                     287
                                                                                                                                                                                                                                  233
                                                                                                                                                                                                                                                              227
                                                                                                                                                                                                                                                                                                                                                                             111
                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            س
KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT 346
                                                                                                                                                                                                                                                GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
                                                                                                                               KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                  gvkpgttasdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdg
                                                                                                                                                                                                                                                                                                                                                                                                       epvqrtavvlsfrsdkegtgekeg----tedsnwav--yfdekrvlkagaitlkagdnl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2001-488774/53.
DB; AASO9168.
                                                                                                                                                                                                                                                                                                                                                                                                                                   ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI------VVTLKAGDNL
                                                                                                                                                                           klvtgkgkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgt
                                                                                                                 kvtfasgngttatvskddggnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tch 89.0%; Score 2658; DB 22; al Similarity 89.4%; Pred. No. 2.7e-144; 542; Conservative 11; Mismatches 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                      466
                                                                                                                                              406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 59
                                                           472
                                                                                                                                                                           352
                                                                                                                                                                                                                                  292
                                                                                                                                                                                                                                                              286
                                                                                                                                                                                                                                                                                          232
                                                                                                                                                                                                                                                                                                                      226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ç
```

6,

527

ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA

```
RESULT 1
AAY23740
                                      В
                                                      Š
                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                  Qy
                                                                          В
                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
  밁
                                                                                                              Matches
                                                                                                                                                                         The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                               (UYQU)
                                                                                                                                                                                                                                                                     Claim 1;
                                                                                                                                                                                                                                                                                                                             WPI; 1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A surface protein of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY23740;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAY23740 standard;
                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                       Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                    N-PSDB;
                                                                                                                                                                                                                                                                                                                                              Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                              14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                           12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Surface protein; surface glycoprotein; immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      587
  115
                    113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        533
                                                                                                             Local Similarity 89.
                                      60
                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13
                                                                                            سر
                                                                           _
                                                                        ESVQR-SVVGSIQASMEGSVELETISLSMINDS-----KEFVDPYIVVTLKAGDNLKI 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    svgyqw 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VIND
                                                                                                                                                                                                                                                                                                                    AAX85792
                                                                                                                                                                                                                                                                     Page 100-101; 132pp;
                                                                                                                                                          594 AA;
                                                                                                                                                                                                                                                                                                                                                               INNOVATION
QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                             Moxon
                                                                                                                                                                                                                                                                                                                                                                                           97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                              98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Protein;
                                                                                                                                                                                                                                                                                                                                              ER,
                                                                                                                      88.2%;
                                                                                                                                                                                                                                                                                                                                              Peak
                                                                                                             15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      594 AA
                                                                                                            Score 2636; DB 20;
Pred. No. 4.8e-143;
5; Mismatches 35;
                                                                                                                                                                                                                                                                                                                                              IRA;
                                                                                                                                                                                                                                                                     English
                                                                                                                                                                                                                                                                                                proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meningitidis.
                               ··vtedsnwgvyfdkkgvltagtitlkagdnlki
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             infection; vaccine,
                                                                                                                                                                                                                                                                                                 useful
                                                                                                                                                                                                                                                                                                 for
                                                                                                                             Length
                                                                                                             Indels
                                                                                                                                                                                                                                                                                                treating
                                                                                                             14;
                                                                                                                                                                                                               humans.
                                                                                                                                                                                                                                                                                                z
                                                                                                            Gaps
                   172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        592
                                                                          59
                                                                                           60
                                                                                                             4.
```

```
RESULT 1
AAY57044
ID AAY57044
ID AAY57044
ID AAY5
XX AAY5
XX AAY5
XX BASE
XX BASE
XX BASE
XX BASE
XX WO99
FT Misc
FT Misc
FT Misc
FT W15-1
PR 13-1
PR 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
This is the Nisseria meningitidis BASB029 amino acid sequence fr serogroup B strain ArCC13090. The BASB029 protein is homologous Haemophilus influenzae surface fibril (HSF) protein. The inventirelates to BASB029 polynucleotide sequences (AAX39864-Z39865) and polypeptide sequences (AAY57044-Y57045) and their immunogenic fr
                                                                                                                                             Claim 4; Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY57044 standard;
                                                                                                                                                                                                                                                            WPI; 2000-053103/04.
N-PSDB; AAZ39864.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY57044;
                                                                                                                                                                                      New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal
                                                                                                                                                                                                                                                                                                                                                                                                                           13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               W09958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BASB029 amino acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                        (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQESSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gkgttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvsps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tasdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nisseria meningitidis;
n; treatment; prevent; a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first
                                                                                                                                           2; 74pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entry)
                                                                                                                                             English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Encoded by AATC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    from N. meningitidis strain ATCC13090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      antibacterial drug
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface fibril protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              234
```

invention

the

and fragments. 6

FFFFFFFF XXX

77777

```
RESULT
AAU06174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local S
Matches 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   meningitidis infection in a mammal. Compositions containing BASB029 polynucleotides and polypeptides are useful for generating an immune response in an animal. A therapeutic composition comprising an antibody directed against BASB029 is useful in treating humans with Neisseria meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029 polynucleotides and polypeptides are also useful for treating infections particularly bacterial infections. The protein is useful in the screening and development of antibacterial drugs. Fused recombinant protein is useful for the stimulation of the immune system of an organis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BASB029 polypeptides are useful in a method of diagnosing a Neisseria meningitidis infection in a mammal. Compositions containing BASB029
۷ Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                          AAU06174 standard;
                                                      24 -OCT - 2001
                                                                                                   AAU06174;
                                                                                                                                                                                                                                                              535
                                                                                                                                                                                                                                                                                                           533
                                                                                                                                                                                                                                                                                                                                                                                                                                              415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitidis EG327 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TASDNYDFYRTYDTVEFLSADTKTTTYNVESKDNGKKTEVKIGAKTSVIKEKDGKLYTGK
                                                                                                                                                                                                                                                                                    QAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHEGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                         SKDANKPYRITNYAPGYKEGDYTNYAQLKGVAQNLNNRIDNYNGNARAGIAQAIATAGLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         qaylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw 594
                                                                                                                                                                                                                                                                                                                                                 skdankpvritnvapgvkegdvtnvaqlkgvaqnlnnhidnvdgnaragiaqaiataglv
                                                                                                                                                                                                                                                                                                                                                                                                                                              kgkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddegalnvg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gkgttatvskddggnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvsps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gdttvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           kqntnentnassftyslkkdltdltsvgteklsfsansnkvnitsdtkglnfakktaetn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KONTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 epvqrtavvlsfrsdkegtgeke-----vtedsnwgvyfdkkgvltagtitlkagdnlki
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tasdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      536;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                    (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein.
                                                                                                                                              Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           88.2%;
89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15;
                                                                                                                                              594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 2636; DB 21;
Pred. No. 4.8e-143;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        system of an organism
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                           592
                                                                                                                                                                                                                                                                                                                                                                                                                                              474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     234
                                                                                                                                                                                                                                                                                                                                                         534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.
```

밁 QY В δÃ В δõ

В ρy

g x g x g x g

Sequence

594

B δÃ

δÃ

В

Qγ В Š 밁 QΥ 뫄 δÃ

B

```
meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than vaccine by the second of the second
                                                                                                                                                                                                                                                                                                                                                                                                                                                            The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Surface antigen NhhA; meningococcal disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria
would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain EG327 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              02-AUG-2001.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                            present invention relates to the isolation of novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2001-488774/53.
DB; AASO9164.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1; 91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= V4
/note= "Variable region
239..594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= V3
/note= "Variable
213..231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /label= C4
/note= "Conserved
232..238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  191..212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= V2
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "Conserved
117..126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note= "Variable
105..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             127..190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ¥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             c5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ċ3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Cl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EG327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Or.
```

88.2%;

Length 594;

4

```
QΥ
                                                                                                                                        QY
                                                                                                                                                                  Ş
            Ş
                         В
                                    δÃ
                                                 В
                                                             õ
                                                                                     QΥ
                                                                                                   В
                                                                                                                              망
                                                                                                                                                      рь
                                                                                                                                                                               В
                                                                                                                                                                                          QΥ
                                                                                                                                                                                                        망
                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                 DЬ
                                                                           밁
                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 536; Conserv
                                                                                                                            175
      533 QAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                          475
                                                                                                     295
                                                                                                                                                                    173
                                                                                                                                                                                115
                                      473
                                                  415
                                                               413
                                                                           355
                                                                                        353
                                                                                                                 293
                                                                                                                                                                                            113
                                                                                                                                                                                                         60
                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                     epvqrtavvlsfrsdkegtgeke-----vtedsnwgvyfdkkgvltagtitlkagdnlki 114
                                                                                                                                                                                                              ESVQR-SVVGSIQASMEGSVELETISLSMINDS-----KEFVDPYIVVTLKAGDNLKI 112
qaylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                          15;
                                                                                                                                                                                                                                                          Score 2636; DB 22;
Pred. No. 4.8e-143;
.5; Mismatches 35;
                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                          14;
                                                                                                                                                                                                                                                          Gaps
                                                               472
594
             592
                         534
                                                  474
                                                                                                    354
                                                                                                                 352
```

Search completed: July Job time: 489 sec ω 2002, 08:09:03

THIS PAGE BLANK (USPTO)

```
Post-processing: Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                        2554.5
2552
2552
2490.5
2490.5
                                                                                                                                                                                                                                                                                                                      2636
2573.5
2573.5
2574.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2699.5
2699.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                    2664
2658
2658
2658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     seq
seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Issued_Patents_AA:*

1: /cgn2_6/ptodata/2,

2: //gn2_6/ptodata/2,

3: /cgn2_6/ptodata/2,

4: /cgn2_6/ptodata/2,

5: //gn2_6/ptodata/2,

6: //gn2_6/ptodata/2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               length: 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query
Match
             1000.0
1000.0
900.4
899.2
889.2
889.2
889.2
885.5
886.2
885.2
885.2
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
885.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.3
865.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 July 3, 2002, 08:10:12; Search time 64.11 Seconds (without alignments) 225.549 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     231628 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-771-382-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Listing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 MNKIYRIIWNSALNAWVAVS.....TASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length DB
             Match 0%
Match 100%
first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        24425594 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gapext 0.5
        US-09-377-155-17
US-09-669-974-15
US-09-377-155-13
US-09-669-974-7
US-09-669-974-7
US-09-669-974-7
US-09-669-974-7
US-09-377-155-9
US-09-377-155-9
US-09-377-155-11
US-09-377-155-11
US-09-377-155-11
US-09-377-155-11
US-09-377-155-11
US-09-377-155-33
US-09-380-347-36
US-09-268-347-36
US-09-268-347-36
US-08-409-995-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     231628
Sequence 17, Appl
Sequence 15, Appl
Sequence 15, Appl
Sequence 13, Appl
Sequence 13, Appl
Sequence 7, Appli
Sequence 7, Appli
Sequence 7, Appli
Sequence 5, Appli
Sequence 5, Appli
Sequence 9, Appli
Sequence 9, Appli
Sequence 21, Appl
Sequence 21, Appl
Sequence 11, Appl
Sequence 12, Appli
Sequence 13, Appl
Sequence 14, Appli
Sequence 3, Appli
Sequence 3, Appli
Sequence 4, Appli
Sequence 3, Appli
Sequence 3, Appli
Sequence 4, Appli
Sequence 6, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Description
        Ş
                                                             р
                                                                                                             Qγ
                                                                                                                                                                뭐
                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-377-155-17 .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 05064/018
CURRENT APPLICATION UNMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR TILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER OF SEQ ID NOS:
SOFTWARE: PatentIn Vo
SEQ ID NO 17
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 17, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard A
                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PatentIn Ver.
```

Result

ĕ.

45	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	31	30	29	28
663	712	732	945.5	945.5	1011	1011	1011	1014	1014	1014	1014	1014	1014	1033	1074.5	1074.5	1074.5
22.2	23.8	24.5	31.7	31.7	33.8	33.8	33.8	33.9	33.9	33.9	33.9	33.9	33.9	34.6	36.0	36.0	36.0
1104	1004	1002	679	679	658	658	658	1098	1098	1098	1098	1098	1098	1094	1912	1912	607
4	4	4	4	4	4	ω	ب	4	4	4	4	ω	ш	4	ω	۳	4
US-09-268-347-28	US-09-268-347-30	US-09-268-347-24	US-09-268-347-26	US-08-913-942-15	US-08-913-942-5	US-08-685-467-5	US-08-409-995-5	US-09-268-347-44	US-09-669-974-32	US-08-913-942-2	US-09-377-155-32	US-08-685-467-2	US-08-409-995-2	US-09-268-347-32	US-08-685-467-4	US-08-409-995-4	US-08-913-942-6
Sequence 28, Appl	Sequence 30, Appl	Sequence 24, Appl	•		Sequence 5, Appli	Sequence 5, Appli	Sequence 5, Appli	Sequence 44, Appl		Sequence 2, Appli	Sequence 32, Appl	Sequence 2, Appli	Sequence 2, Appli	Sequence 32, Appl	Sequence 4, Appli	Sequence 4, Appli	Sequence 6, Appli

## ALIGNMENTS

NOVEL SURFACE ANTIGEN

Minimum DB Maximum DB

Sequence:

```
Query Match 100.0%; Score 2987; DB 4; Best Local Similarity 100.0%; Pred. No. 2.9e-229;
                                    241 VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                   181 GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                      301 TDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKYTFASGNGTTATV
                                                                                                                                                                                                                                         1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                  1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                     Length 592;
                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                       240
                                                                      300
                                                                                                                                                                                                                                                                                                                   60
                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                     0;
```

```
RESULT 2
US-09-669-974-17
; Sequence 17, Applic
; Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
ď
                            Ş
                                                         Вþ
                                                                                  δÃ
                                                                                                                   뫄
                                                                                                                                            γQ
                                                                                                                                                                            ₽
                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQ ID NO 17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR TILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH: 59
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                            ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                      241
                                                                                                                                               181
                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                301
                                                           241
                                                                                                                     181
                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                       Local Similarity
les 592; Conserv
                                                        VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS 300
                                                                                                                                                                                                                                                                                           MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPV 480
                                                                                                                                 GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF 240
                                                                                                                                                                                           NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN 180
                                                                                                                                                                                                                                   ESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                            NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RITHVAPGVKEGDVTHVAQLKGVAQNLHHRIDHVHGHARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                              TDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATV
               Application US/09669974
                                                                                                                                                                                                                                                                                                                                                  100.0%;
nilarity 100.0%;
Conservative 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                       0,:
                                                                                                                                                                                                                                                                                                                                                     Score 2987; DB 4;
Pred. No. 2.9e-229;
; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                  592;
                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                  240
                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                       0;
```

```
밁
                                                             20
                                                                                                    Дb
                                                                                                                                  Š
                                                                                                                                                                   DЪ
                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                      QУ
                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: PEAK, IAN
APPLICANT: JENNINGS,
APPLICANT: MOXON, E.
TITLE OF INVENTION:
FILE REFERENCE: 0550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 15, Application Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQ ID NO 15
LENGTH: 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                   300
                                                                 293
                                                                                                    240
                                                                                                                                                                     180
                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                       115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
 353
                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL 60
GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                               GKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKYTFAS 352
                                                                                                  GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT 232
                                                                                                                                                                                                                                      NKNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                       --NTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN 172
                                                                                                                                                                                                                                                                                                         EPVVRSALVLQFMIDKEGNGENESTGNIGWSIYYDNHNTLHG-ATVTLKAGDNLKIKQNT 119
                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKS 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NINAGNNIEITRNGKNIDIATSMTPQFSSYSLGAGADAPTLSVDDEGALNVGSKDANKPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSFSKGKMDETV 420
                                                                                                                                                                                                                                                                                                                                        ESVQRS-VVGSIQASMEGSVELET---ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTFASGNGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                   GDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JENNINGS, Michael Paul MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ian Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NOVEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                           90.4%; Score 2699.5; 91.2%; Pred. No. 2e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US/09377155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                            11;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                    2e-206;
33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         592
                                                                                                                                                                                                                                                                                                                                                                                                                                           9;
                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
 412
                                                                                                                                     292
                                                                                                                                                                                                                                        179
                                                                                                                                                                                                                                                                                                                                          114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                     299
                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                            4;
```

```
Ş
                                                                                                                         DЬ
                                                                                                                                                  δÃ
                                                                                                                                                                                            В
                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-669-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                   õ
                                                      망
                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; ORGANISM: Neisseria meningitidis US-09-669-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQ ID NO 15
LENGTH: 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 15, Application US/09669974 Patent No. 6333173
                   353
                                                      300
                                                                                        293
                                                                                                                           240
                                                                                                                                                          233
                                                                                                                                                                                              180
                                                                                                                                                                                                                               173
                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                    115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Match 90.4%; Score 2699.5; DB 4. Local Similarity 91.2%; Pred. No. 2e-206; les 547; Conservative 11; Mismatches 33;
                                                                                                                                                                                                                                                                                                                                                                                                       ۳
                                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                  GKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                        TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK 292
                                                                                                                                                                                                            GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT 232
                                                                                                                                                                                                                                                                                 --NTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN 172
                                                                                                                                                                                                                                                                                                                                                      ESVQRS-VVGSIQASMEGSVELET---ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                               NKNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                    EPVVRSALVLQFMIDKEGNGENESTGNIGWSIYYDNHNTLHG-ATVTLKAGDNLKIKQNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                         TASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9;
                                                                                                                                                                                                                                                                                                                                    119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                532
                   412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     472
                                                                                                                                                                                                                                                             179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       419
                                                      359
                                                                                                                                                                                            239
```

```
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOCTWARE: Patentin Ver. 2.0
SEQ ID NO 13
LENGTH: 598
                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 5
US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
 ₽
                            δÃ
                                                              밁
                                                                                     Qy
                                                                                                                          В
                                                                                                                                                    Q
                                                                                                                                                                                       B
                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
Matches 544; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 13, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                            233
                                                                                                                                                                                       173
                                                                                                                                                                                                                                                   113
                                                                                                                                                                                                                                                                                 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360 GKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                              293
                                                                                                                                                                                                                    167
                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                       KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                 KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLV 532
GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                      ETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                   KIKQNTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                            GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                      ETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                              EPVQRTAVVLSFRSDKEGTGEKEG-----TEDSNWAV--YFDEKRVLKAGAITLKAGDNL
                                                                                                                                                                                                                                                                                                                              ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI------VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDKGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                    89.8%; Score 2667;
89.8%; Pred. No. 7
                                                                                                                                                                                                                                                                                                                                                                                                                                       10;
                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 4;
7.8e-204;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              599
                                406
                                                                                                                                                                                                                    226
                                                                                                                                                                                                                                                                                                                                                                            59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           539
   412
                                                                352
                                                                                             346
                                                                                                                            292
                                                                                                                                                          286
                                                                                                                                                                                                                                                                                                              112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        479
                                                                                                                                                                                                                                                                                                                                                                                                                                         6,
```

Š

407

GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE

```
PRIOR APPLICATION NUMBER: US 09/377,155

PRIOR FILING DATE: 1999-08-19

PRIOR APPLICATION NUMBER: PCT/AU98/01031

PRIOR FILING DATE: 1998-12-14

PRIOR APPLICATION NUMBER: GB 9726398.2

PRIOR FILING DATE: 1997-12-12

NUMBER OF SEQ ID NOS: 33

SOFTWARE: PATENTIN VET: 2.0

SEQ ID NO 13
               Q
                                               망
                                                                           οy
                                                                                                               В
                                                                                                                                           QY
                                                                                                                                                                             멍
                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                           80
                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                      QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-669-974-13
: Sequence 13, Application US/09669974
: Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; ORGANISM: Neisseria meningitidis US-09-669-974-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE AI
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LENGTH: 59
TYPE: PRT
                                                                                                                                                                                                                167
                                                                                                                                                                                                                                              113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               467
                347
                                                                                                                                                                                173
                                                                                                                                                                                                                                                                                111
                                                                               287
                                                                                                                233
                                                                                                                                                227
                                                293
                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
nes 544; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA 586
                                                                                                             KIKQNINENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GALNVGSKDANKPVRIINVAPGVKEGDVINVAQLKGVAQNLNNRIDNVNGNARAGIAQAI 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT 346
                                                                                                                                                                                               ETAGTNGDTTVHLNGIGSTLIDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK 226
                                                                                                                                                                                                                                                                                                         MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SVGYQW
KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                               ETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                              KIKQNTNENTNESTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAK 172
                                                                                                                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI 532
                                                KLYTGKGKDENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                           ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI-----VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                        89.3%; Score 2667; DB 4;
89.8%; Pred. No. 7.8e-204;
tive 10; Mismatches 30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                           22;
                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               472
                                                                                                                                                                             232
                                                                                                               292
                                                                                                                                                                                                                                                                                                                                                                                                                                           6
```

```
밁
                                                              Q
                                                                                                   В
                                                                                                                                   δÃ
                                                                                                                                                                       В
                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                           Dр
                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SUFFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 7
US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 7 Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: PatentIn Ver. 2.0 SEQ ID NO 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LENGTH: 594
TYPE: PRT
ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             473
                                   293
                                                                   291
                                                                                                     233
                                                                                                                                       231
                                                                                                                                                                         173
                                                                                                                                                                                                           171
                                                                                                                                                                                                                                             113
                                                                                                                                                                                                                                                                             111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 353
 351
                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                  KIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAG 170
                              GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF 350
                                                                                                   TNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                             KIKQNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                               EPVQRTAVVLSFRSDKEGTGEKEG----TEDSNWAV--YFDEKRVLKAGAITLKAGDNL 112
                                                                                                                                                                                                                                                                                                                                               ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI------VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA 586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GALNYGSKDANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNRIDNYDGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GALNYGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE 466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS 410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATAGLAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGASA
                                                                                                                                                                       {\tt TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7, Application US/09377155
5, 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           598
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   89.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2664; DB 4;
Pred. No. 1.3e-203;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                    33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             532
                                                                                                                                                                                                         230
                                                                                                                                                                                                                                                                                                                                                                                    59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               526
                                                                                                       292
                                                                                                                                                                                                                                              172
                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                           232
```

```
; LENGTH: 594
; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-669-974-7
                                                                                             γQ
                                                                                                                     밁
                                                                                                                                         δã
                                                                                                                                                                 Вb
                                                                                                                                                                                    δÃ
                                                                                                                                                                                                            Вр
                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 8
US-09-669-974-7
; Sequence 7, Application US/09669974
; Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
           Š
                                В
                                                     20
                                                                            В
                                                                                                                                                                                                                                                                                                                                                         SOFTWARE: PatentIn Ver. 2.0 SEQ ID NO 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                                                                                                                                                        Matches 542;
                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR EILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION NUMBER: US 09/377,155 PRIOR FILING DATE: 1999-08-19
             291
                                  233
                                                                             173
                                                                                                  171
                                                                                                                        113
                                                                                                                                           111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               353
                                                                                                                                                                  60
                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                          GKGKGENGSSTDEGEGLYTAKEYIDAYNKAGWRMKTTTANGQTGQADKFETYTSGTKYTF
                                TNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                    KIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAG
                                                                                                                                                                            ESVQR-SVVGSIQASMEGSVELETISLSMINDSKEFVDPYI------VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EPVQRTAVVLSFRSDKEGTGEKEG-----TEDSNWAV--YFDEKRVLKAGAITLKAGDNL 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        592
                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                     89.2%; Score 2664; DB 4; 90.0%; Pred. No. 1.3e-203; tive 9; Mismatches 33;
                                                                                                                                                                                                                                                                          Length 594;
                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                       18;
                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           530
                                                                                                                                          170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              412
                                                                                               230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        532
                                 292
                                                      290
                                                                            232
                                                                                                                     172
                                                                                                                                                                                                                                                     5,
```

```
Q
δõ
                        뫄
                                                   δÃ
                                                                                망
                                                                                                      ρy
                                                                                                                                      В
                                                                                                                                                               δã
                                                                                                                                                                                              밁
                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                ; ORGANISM: Neisseria meningitidis US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: Pa
SEQ ID NO 5
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 5, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                          Best Local Similarity Matches 542; Conserv
                                                                                                                                                                                                                                                                                                                       Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH: 59
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         413
                                                                                                                                        113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 353
 287
                                                                                                             167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         293 GKGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                               60
                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                   KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK
                                                                                                                                                                                                            ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI------VVTLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8-8
8-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                           GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDG
                                          GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                EPVQRTAVVLSFRSDKEGTGEKEG-----TEDSNWAV--YFDEKRVLKAGAITLKAGDNL
                                                                                                                                                                                                                                                     MNKISRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PSKGKMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                                                                                                                                                    PatentIn Ver.
                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                          89.0%; Score 2658; DB 4;
89.4%; Pred. No. 4e-203;
ative 11; Mismatches 31;
                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                            Indels 22;
 346
                                                                                 232
                                                                                                                                                                   166
                                                                                                                                                                                                                        110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     470
                                                                                                                                         172
                                                                                                                                                                                               112
                                                                                                                                                                                                                                                     59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   412
                           292
                                                       286
                                                                                                                                                                                                                                                                                60
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 10
US-09-669-974-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
ð
                             Q
                                                         멍
                                                                                QY
                                                                                                               Вþ
                                                                                                                                         QY
                                                                                                                                                                      Вþ
                                                                                                                                                                                               Ş
                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR EPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR EPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 5, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                SEQ ID NO 5
LENGTH: 598
                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                          ORGANISM: Neisseria meningitidis -09-669-974-5
                                                                                                                                                                                                                                                                                                                                                                                      TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   467
                                                                                                                  113
                                                            173
                                                                                    167
                                227
                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                         60
                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |||||||
|WOYDVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATAGLAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSA 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS 406
                                                                                                                             KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK 166
                                                                                                                                                                                                  ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI-----VVTLKAGDNL 110
                                GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                  KIKQNTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAK
                                                                                                                                                                        EPVQRTAVVLSFRSDKEGTGEKEG-----TEDSNWAV--YFDEKRVLKAGAITLKAGDNL 112
                                                                                                                                                                                                                               MNKISRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL 59
                                                                                                                                                                                                                                                                                       al Similarity
542; Conser
                 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       592
                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                89.0%;
89.4%;
                                                                                                                                                                                                                                                                                       11;
                                                                                                                                                                                                                                                                                                   Score 2658; DB 4
Pred. No. 4e-203;
                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                DB 4;
                                                                                                                                                                                                                                                                                       31;
                                                                                                                                                                                                                                                                                                                Length 598;
                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                       22;
                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                   172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                352
                                 286
                                                                                                                                                                                                                                                                                       6
```

```
SOFTWARE: PatentIn Ve
SEQ ID NO 9
LENGTH: 594
TYPE: PRT
ORGANISM: Neisseria m
US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
Q
                            밁
                                                  QΥ
                                                                              Вþ
                                                                                                     δÃ
                                                                                                                                  Вþ
                                                                                                                                                         Qy
                                                                                                                                                                                    В
                                                                                                                                                                                                                                     Query Match 80.2
Best Local Similarity 89.3
Matches 536; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 9, Application Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                              PRIOR APPLICATION NUMBER: GB (
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AD98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: FILE REFERENCE: 06!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 527
    233
                             175
                                                      173
                                                                                115
                                                                                                         113
                                                                                                                                   60
                                                                                                                                                            61
                                                                                                                                                                                     ۳
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAI 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                   MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GALNYGSKDANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNRIDNYDGNARAGIAQAI
                                                                                          KQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN 172
                                                                                                                                                 ESVQR-SVVGSIQASMEGSVELETISLSMINDS-----KEFVDPYIVVTLKAGDNLKI 112
                                                                                                                                                                                     MNKTYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL
                                        GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT 232
                                                                                KONTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETN
                                                                                                                                  EPVQRTAVVLSFRSDKEGTGEKE-----VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI
  TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                            GDTTYHLNGIGSTLTDTLLNTGATTNYTNDNYTDDEKKRAASYKDYLNAGWNIKGYKPGT
                                                                                                                                                                                                                                                                                                                                                                     PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JENNINGS, Michael Paul
MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PEAK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                  meningitidis
                                                                                                                                                                                                                                                     88.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US/09377155
                                                                                                                                                                                                                                                                                                                                                                         2.0
                                                                                                                                                                                                                                                                                                                                                                                                             GB 9726398.2
                                                                                                                                                                                                                                          15;
                                                                                                                                                                                                                                         Score 2636; DB 4;
Pred. No. 2.2e-201;
5; Mismatches 35;
                                                                                                                                                                                                                                                                   DB 4;
                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                            14;
                                                                                                                                                                                                                                          Gaps
                                                                                                                                      114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            406
      292
                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292
                                234
                                                                                    174
```

```
Qy
                                                                                                                                                                                                                                                                                                   ; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 12
US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                     В
                                                            QΥ
                                                                                      망
                                                                                                         Ş
                                                                                                                                     Ъ
                                                                                                                                                                                      밁
                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                         SEQ ID NO 9
LENGTH: 594
                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 9, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                         Matches
                                        175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  235
               233
                                                                                        115
                                                                                                               113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          293
                                                                                                                                        60
                                                                                                                                                               61
                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                                                                                                  1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ESVQR-SVVGSIQASMEGSVELETISLSMTNDS-----KEFVDPYIVVTLKAGDNLKI 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS
 TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                      EPVQRTAVVLSFRSDKEGTGEKE-----VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI
                                                                                                                                                                                      MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                     88.2%; Score 2636; DB 4;
89.3%; Pred. No. 2.2e-201;
tive 15; Mismatches 35;
                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                               594;
                                                                                                                                                                                                                                      14;
                                                                                                                                     114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      412
              292
                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 294
Ş
                       Вb
                                                Ş
                                                                         망
                                                                                              ρy
                                                                                                                         망
                                                                                                                                              Ş
                                                                                                                                                                           밁
                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                  TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          415
  294
                         234
                                                 234
                                                                                                  174
                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             295
```

```
ORGANISM: Neisseria
US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 13
US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 21, Application US/09377155 Patent No. 6197312 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQ ID NOS:
SOFTWARE: PatentIn Vo
SEQ ID NO 21
LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     235 TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                               DKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
KGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTFASG
                                            ASDNVDFVRTYDTVEELSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKG
                                                                                       KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                              ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                        524;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitidis
                                                                                                                                                                                                                                                                                                                                                   86.2%;
87.5%;
                                                                                                                                                                                                                                                                                                                                                     Score 2573.5; DE Pred. No. 2e-196;
                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                 DB 4;
                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                   Length 591;
                                                                                                                                                                                                                                                                                                                                      15;
 353
                                                                                          233
                                                                                                                                                                                    173
                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     294
                              293
                                                            293
                                                                                                                                                     173
                                                                                                                                                                                                                                                                                                                                      6
```

```
Š
                                                                           Ωy
                                                                                                                 망
                                                                                                                                               Qγ
                                                                                                                                                                               В
                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                В
                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; LENGTH: 591
; TYPE: PRT
; ORGANISM: Neisseria
US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 14
US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: PatentIn Ver. SEQ ID NO 21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 21, Applia Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       414
                                                                                                                   174
                                                                                                                                                  174
                                                                                                                                                                                   120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       354
                  294
                                                                                 234
                                                                                                                                                                                                                   114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEE- 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKG
                                                                                                                                  DTTVHLNG IGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                   Q-----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                  QNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                 YLDPVQRTVAVLIVNSDKEGTGEKEKVE-ENSDWAVYFNEKGVLTAREITLKAGDNLKIK 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQ 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 413
KGENGSSTDEGEGLUTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKYTFASG
                                                                                                                 DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                    -LESVQRSV-VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV----VTLKAGDNLKIK 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ
                                                 ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Application US/09669974
                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                     86.2%;
87.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2.0
                                                                                                                                                                                                                                                                                                                                                                                     23;
                                                                                                                                                                                                                                                                                                                                                                                  Score 2573.5;
Pred. No. 2e-1:
23; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                     2e-196;
                                                                                                                                                                                                                                                                                                                                                                                                                   DB 4;
                                                                                                                                                                                                                                                                                                                                                                                    37;
                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                     591;
                                                                                                                                                                                                                                                                                                                                                                                    15;
                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                 353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       472
                                                                                                                                                                                                                                                                                                                                                                                    6;
```

```
Qy
                                                                                                    д
                                                                                                                                  δõ
                                                                                                                                                                      рь
                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
Q
                                 рЬ
                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 11
LENGTH: 591
TYPE: PRT
ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: PEAK, IAN APPLICANT: JENNINGS, APPLICANT: MOXON, E. TITLE OF INVENTION: FILE REFERENCE: 0650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 11, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: GB 9
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATCHTS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AD98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               414
354
                                                                  294
                                                                                                     234
                                                                                                                                      234
                                                                                                                                                                        174
                                                                                                                                                                                                          174
                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 354
                                   294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   294
                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                YLDPVLRTVAVLIVNSDKEGTGEKEKVE-ENSDWAVYFNEKGVLTAREITLKAGDNLKIK 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS 473
                                                                                                                      ASDNVDFVRTYDTVEELSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKG
                                                                                                                                                                                        DTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT 233
                                                                                                                                                                                                                                                            QNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNG 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 413
NGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 413
                                                KGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASG 353
                                                                                                                                                                                                                                            Q-----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ 532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQ 533
                                                                                                     ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKD
                                                                                                                                                                      DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                            -LESVQRSV-VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV----VTLKAGDNLKIK 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PEAK, Ian Richard Anselm
JENNINGS, Michael Paul
MOXON, E. Richard
VENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                    85.5%; Score 2554.5; DB 4
87.0%; Pred. No. 6.6e-195;
tive 24; Mismatches 39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GB 9726398.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                      15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         591
                                                                                                                                                                                                                                            173
                                                                                                     293
                                                                                                                                                                        233
                                                                                                                                                                                                                                                                                                                                                                                                                                                      6
```

. B Q	DЬ	Qy	DЪ	Qy	Db
534 533	473	474	414	414	354
534 AYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHEGASASVGYQW 592 	473 KKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ 532	474 KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQ 533	414 GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGS 472	414 GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS 473	

Search completed: July 3, 2002, 08:10:14 Job time: 526 sec

THIS PAGE BLANK (USPTO)

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Total number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10
11
        Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
  2573.75

5911

5913

392.5

379.5

379.5

379.5

373.5

321.5

256.5

243.1

226.5

223.5

223.5

221.5

221.5

221.5

221.5

221.5

221.5

223.5

221.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

223.5

22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       seq
seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-771-382-2
2987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <del>4</del> 3 : 1 :
     PIR_71:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         283138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          July 3,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GenCore version 4.5
Copyright (c) 1993 - 2000 Com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVAVS....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              pir1:*
pir2:*
pir3:*
pir4:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       seqs, 96089334 residues
  1588
1588
11087
11190
11190
11190
11305
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11343
11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2002, 08:11:59; Search time 95.27 Seconds (without alignments) 597.091 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DВ
                                                                                                                                                        D85724
T31105
G64964
AF0394
AD0123
H83135
E97835
A41477
B85547
                                                                                                                                                                                                                                                                                                                                                                                        A81888
G81133
I64136
D82671
A86036
H91188
AC09188
AC0917
A860110
C82672
A64905
A44905
A6490893
A56143
                             F90696
D90803
H85611
S57664
S76109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Compugen Ltd
                                                                                                                                                                                                                             hypothetical prote
surface-array prot
hypothetical prote
hypothetical prote
hypothetical prote
probable adhesin h
probable autotrans
probable adhesin p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              adhesin homolog HI
surface protein XF
probable adhesin Z
probable adhesin E
                                                                          probable RTX family hypothetical prote AidA-I adhesin-lik probable adhesin z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   probable autotrans
surface protein XF
probable surface p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface-exposed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      probable surface
adhesin NMB0992 |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Description
hypothetical prote
probable exported
                                                                                                                                                                                hypothetical prote
190K surface antig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ydeK protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                        high-molecular-wei
                                                     gA-specific metal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2
```

4 4	43	42	<b>4</b> 0	39	38	37	36	35	34	33	32	31	30
192	192	193	194.5	197	197.5	198	199	200	200.5	201	203	203	203.5
6.4	0 0 4 4	6.5	ი ი	6.6	6.6	6.6	6.7	6.7	6.7	6.7	6.8	6.8	6.8
1428	1327	1430	920 1361	1417	4152	2020	936	1275	1477	1577	1651	1286	2232
2	งง	ν:	N N	2	ν	N	N	N	N	N	N	N	Ν
AC2224	B90674	AF0351	T40614	A83080	T31102	C48399	I40711	T33369	B43855	A35140	JC1340	S28634	T34434
hypothetical prote	AidA-I adhesin-lik prohable beta-barr	probable autotrans	surface array prot S-laver protein -	hypothetical prote	filamentous hemagg	ABC-type transport	sapB protein - Cam	hypothetical prote	high-molecular-wei	hemolysin A precur	outer membrane pro	adhesin AIDA-I pre	hypothetical prote

## ALIGNMENTS

probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Date: 05-May-2000 #sequence\_revision 05-May-2000 #text\_change 02-Feb-2001 C;Accession: A81888

R;Parkhill, J.; Achtman, M.; James, K.D.; Bentley, ; Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Nature 404, 502-506, 2000

S.D.; Churcher, C.; Klee,
Mungall, K.; Quail, M.A.;

S.R.; Mo Rajandre (strain

A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis Z2491
A;Reference number: A81775; MUID:20222556
A;Accession: A81888
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-592 <PAR>
A;Cross-references: GB:AL162755; GB:AL157959; NID:g7379742; PIDN:CAB84461.1; PID:g737
A;Experimental source: serogroup A, Strain Z2491
C;GenetLcs:
A;Gene: NMA1200 밁 δÃ δÃ 밁 δÃ В ρ В Š Вb QΥ 밁 Matches Query Match Best Local 359 359 299 239 239 181 181 121 121 Local Similarity 61 61 1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEE 60 GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--SDNV 238 NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN 180 GIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQSENV NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN ESVQRSVVGSIQASMEGSGELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT 120 ESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT 120 SSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKYTFASGNGTTA Conservative 93.0%; Score 2779; Di Pred. No. 1.2e 9; Mismatches 9; l.2e-131; nes 23; DB Length Indels 592; 4. Gaps 418 418 180 358 358 298 298 238 2

```
C;Accession: G81133
R;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Elsen, J. Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B.A. rl, H.; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M. Science 287, 1809-1815, 2000
A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Eraser, C.M.; Moxon, E.R.; Rappuoli, R.; V. A;Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58.
A;Reference number: A81000; MUID:20175755
A;Accession: G81133
                                 ρ
                                                                       맑
                                                                                                     Qy
                                                                                                                                           В
                                                                                                                                                                         QY
                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup C;Species: Neisseria meningitidis C;Date: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
Dр
                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                              д
                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 멍
                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: DNA
A; Residues: 1-591 <TET>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Experimental source: serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Cross-references: GB:AE002450;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
 414
                                                                                                                                                                                                                   234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            419
                                                                         354
                                                                                                                                             294
                                                                                                                                                                                 294
                                                                                                                                                                                                                                                      234
                                                                                                                                                                                                                                                                                          174
                                                                                                                                                                                                                                                                                                                              174
                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   μ
 GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGS
                  GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS
                                                                                                                                                                                                               MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK
                                                                                                                                                              KGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPG
                                                                       KGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK
                                                                                                                                                                                                                                                                                                                                                                                                    QNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNG 173
                                                                                                                                                                                                                                                                                                                                                                                                                                        YLDPVQRTVAVLIVNSDKEGTGEKEKVE-ENSDWAVYFNEKGVLTAREITLKAGDNLKIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                          -LESVQRSV-VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV----VTLKAGDNLKIK 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                             KGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNYTFASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    86.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2573.5; DB 2;
Pred. No. 2.2e-121;
23; Mismatches 37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GB:AE002098; NID:g7226229; PIDN:AAF41395.1; PID:g722623
B, strain MC58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 592
                                                                                                         413
                                                                                                                                                                               353
                                                                                                                                                                                                                                                      293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              478
                                                                     413
                                                                                                                                                                                                                   293
                                                                                                                                                                                                                                                                                                                          233
                                                                                                                                                                                                                                                                                                                                                                173
                                                                                                                                                                                                                                                                                          233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6
```

```
C;Accession: I64138
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.;
Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.
D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghage
Science 269, 496-512, 1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 adhesin homolog HI1732 - Haemophilus influenzae (strain Rd KW20)
C;Species: Haemophilus influenzae
C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 24-Oct-1997
                                   Š
                                                                            밁
                                                                                                                 Ş
                                                                                                                                                        В
                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                     ОÃ
                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Status: nucleic acid sequence not shown; translation not shown A;Molecule type: DNA A;Residues: 1-298 <TIGR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; A; Title: Whole-genome random sequencing and assembly of Haemophilus influenzae IA; Reference number: A64000; MUID:95350630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Residues: 1-298 <TIGR>
A;Cross-references: GB:U32846; GB:L42023; NID:g1574588; PID:g1574589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Reference number: A64000; A; Accession: I64138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
263
                                                                                                                                                        147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             533
                                                                                                                                                                                               159
                                                                                                                                                                                                                                                                             110
                                                                                                                                                                                                                                      95
                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Match 19.8%;
Local Similarity 44.1%;
nes 147; Conservative 4
                                                                                                                                                                                                                                                                                                                                                          51
                                                                                                                                                                                                                                                                                                                                                                                                 ب
                                                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQA------N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SVIKDNNGKLLTGKQLKDANTGTATNATEDTDE
                                     SVIKEKDGKLVTGK-----
                                                                          {\tt LNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT}
                                                                                                                                                          ADGLKLAK----GTNGDTAVHLNGLASTLPDVTTNTGASTSVT-FSPSDIEKTRAATIKDV
                                                                                                                                                                             TKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDV
                                                                                                                                                                                                                                    LKAKL----DQGGKSVTFALAKDL----DVKTAKVSDTLTIGGNTPAAGGATPKVSITST
                                                                                                                                                                                                                                                                           LKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLS------FGANGKKVNIISD 158
                                                                                                                                                                                                                                                                                                                     STEDDIED-
                                                                                                                                                                                                                                                                                                                                                        ATDEDEEEELESVQRSVVGSIQASMEGSVELETISLSMTNDSK-EFVDPYIVVTLKAGDN 109
                                                                                                                                                                                                                                                                                                                                                                                               MNKTFKVTWNVVTQTWVVVSELTRAHTKRTSATVATAVLATVLSATVQAINDAGTFVKVQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KDANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNRIDNYNGNARAGIAQAIATAGLYQ
                                   -GKGENGS-STDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 591; DB 2; 1
Pred. No. 9.2e-23;
10; Mismatches 78;
                                                                                                                                                                                                                                                                                                                     ----SAATKDDNKNQALKAGDTLTLKAGKN
295
                                       303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 298;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 influenzae Rd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TIGR:HI1732
                                                                                                                     278
                                                                                                                                                                                               218
                                                                                                                                                                                                                                      146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              533
                                                                              262
                                                                                                                                                          202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Kerlavage
1.; Weidman
jen, N.S.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Vente
```

```
RESULT 4

D82671

surface protein XF1529 [imported] - Xylella fastidiosa (strain 9a5c)

C;Species: Xylella fastidiosa
C;Ate: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000

C;Accession: D82671

R;anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide
Nature 406, 151-157, 2000

A;Title: The genome sequence of the plant pathogen Xylella fastidiosa.

A;Reference number: A82515; MUID:20365717

A;Note: for a complete list of authors see reference number A59328 below

A;Accession: D82671

A;Status: prelininary
A;Molecule type: DNA
A;Residues: 1-2059 <SIM>
```

Seq

```
A;Cross-references: GB:AE003982; GB:AE003849; NID:g9106554; PIDN:AAF84338.1; GSPDB:GN008]
A;Experimental source: strain 9a5c
R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; ABriones, M.R.S.; Bueno, M.R.B.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H. as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frohm J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigu chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marrino, C.L.; Marques, M.V.; Martins, H.A.; Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyakl, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.P. A;Authors: da Silva, A.C.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silvaira, A.C.; Palmieri, D.P. A;Reference number: A59328
A.;Contents: annotation
C.Contents: annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
   В
                                                      Š
                                                                                                                         밁
                                                                                                                                                                                Š
                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 13.1%; Score 392.5; DB 2; Best Local Similarity 24.8%; Pred. No. 9.5e-12; Matches 173; Conservative 98; Mismatches 225;
                                                                                                                                                                                                                                                                                                                                                                                                                                       395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    245
AVGVSAVSESGHWVFKFSGSANTRSHVGVGAGVGYQW 2059
                                                                                                                                                                                                                                                                                                                                                                          NNIEDVFKITKGDSASSVKG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GVGTQASGEGAAAVGSGAAASGKGSTAIGRNAIASADGSVALGDGAKDGGRGAESYTGKY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -NDNVTDDEKKRAASVKDVLNAGWNI------KGVKPGTTASDNVD------FVRTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EETDAVNFSQLKSISTAVD---QGWTLTASGANGSK--VASGGTVDLKNTDGNLTISKSG 1456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EELESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGD-NLKIKQNT 116
                                                                                                                                                             LKGVAQNLNNRIDNVNGNAR----AGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SGVQNNTVGTVSVGDAAKGETRSISNVADAKEAMDAVNLRQLDAVAQKSNLQTDDMRHEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VISHVAVGMADTDAVNVSQLKQAVQSVTVKATRYYSTNDGGTQGGNYDGDGATGSKAIAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DVVFNLSKDFKVDEVTAGNTVVNTDGVKVG--SDVSLGAMGLFIANGPSVTASGFNAGDK 1686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DTVEFLSADTK - - - - - - TTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DTDAVNFSQLK---SVSEAVDKGWTLTASGANGSKVVSGGTVDLKNTDGNLAISKSGDSN 1628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TLANGESVVNRTVVNGDGVNIDDVVVVNDLGLSIVGGASLTLSGINAGSHKITNVTAGTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DSNDVVFNLSEDLKEKSITVGNTQLDK-----DGVKVSSNVLLDSNELVITSHSSTSSVK 1511
                                                                                                                      LNQGLITAKQYTDGMVGNLRRETSGGVAAAIATANLPQAYVQGRGMTSVGVSSYQGQSAI
                                                                                                                                                                                                                                                                                                          ATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKV--NIISDTKGLNFAKETAGT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----GSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTG-----QADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                KAVAGSSGKVISGNVSPSKGKMDETVNINA---GNNIEITRN----GKNIDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -FASGNGTT----ATVSKD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----DALNVNQL----QNSGWNLDS----
                                                                                                                                                                                                                                                                                                                                                                   -MGVNAMAIGTNAAVSGTESVALGKNTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 2059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels 201;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -DQG----NITVKY 372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               32;
```

```
A;Title: Genome sequence of enterohemorrhagic Escherichia coli O157:H7. A;Reference number: A85480; MUID:21074935; PMID:11206551
A;Recession: A86036
A;Status: preliminary
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-1588 <STO>
A;Cross-references: GB:AE005174; NID:g12518349; PIDN:AAG58749.1; GSPDB:A;Experimental source: strain O157:H7, substrain EDL933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       probable adhesin Z5029 [imported] - Escherichia coli (strain O157:H7, substrain EDL93 C;Speciles: Escherichia coli
C;Speciles: Escherichia coli
C;Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001
C;Accession: A86036
R;Perna, N.T.; Plunket III, G.; Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; May 11ler, L.; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis, K.; Apoda Nature 409, 529-533, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Experimental source: strain C; Genetics: A; Gene: Z5029
                                                                                                             δõ
                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INDSKEFVDPYIVVTLKAGDNLKIKQNT---NENTNASSFTYSLKKDLTGLINVET--EK 143
KSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TNVTNDNV-----TDDEKKRAASVKD-----VLNAGWNIKGVKPGTTASDNVDFVRTY 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LAFNDASAQGVGATAIGYNSVAKGDSSVAIGQGSYSDVDTGIALGSSSVSSRVIAKGSRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEDSTDAVNG----SQLNATNMMIEQNTQIINQLAGNTDATY-IQENGAGINYVRTNDDG 1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAPTYTIANAEYNNV-GDALDALDDNALLWDETANGGAGAYNASHDGKASIITNVANGSI 1008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TVKTAVLATLLFATVQANATDEDEEEEL -- ESVQRSVVGSIQASMEGSVELET -- ISLSM
                                                         NNNDYVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPG
                                                                                                                                                                         NVAAGKNATDAVNVAQLKSSEAGGVRYDTKADGSIDYSNITLGGGNGG-TTRISNVSAGV
                                                                                                                                                                                                                                N----GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGV
                                                                                                                                                                                                                                                                                            KYFKTNTDGVDASAQGKDSVAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRIT
                                                                                                                                                                                                                                                                                                                                                                                                         VAAGSADTDAVNVGQLKVTDAQVSQNTQSITNLDNRVTNLDSRVTNIENGIGDIVTTGST 1355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                --TGQADKFETVTSGTKVTFASGNGTTATVSKDDQ-----GNITVKYDVNVGDAL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GIAIGSNAQVIHVNSIAIGNGSTTTRGAQTNYTAYNMDAPQNSVGEFSVGSADGQRQITN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QNAIGAVATTPTKYFHANSTEEDSLAVGTDSLAMGAKTIVNGDKGIGIGYGAYVDANALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DTVEFLSADTKTTTVNVESKDNGK----KTEVKIGAKTSVIKEK------DGKLVT 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TSITENGVVIGYDTTDGELLGALSIGDDGKYRQIIN-----VADGSEAHDAVT-VRQL 1175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -GANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGA-T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12.7%; Score 379.5; DB 24.8%; Pred. No. 3e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     94;
                                                                                                                -----NLNNRIDNVNGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GSPDB:GN00145; UWGP:
                                                                                                                                                                            1474
                                                                                                                                                                                                                                                                                                                                                      432
                                                                                                                                                                                                                                                                                            1415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         23;
```

RESULT 6 H91188

probable adhesin ECs4480 [similarity] - Escherichia coli (strain 0157:H7, substrain

```
RESULT 7
AC0976
AC1976
AC1976
A:Note: this species has also been called Salmonella typhi
A:Note: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Accession: H91188
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-1588 <AAY>
A;Experimental source: strain O157:H7, substrain RIMD 0509952
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA Res. 8, 11-22, 2001
A;Title: Complete genome sequence of enterohemorrhagic E
A;Reference number: A99629; MUID:21156231; PMID:11258796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          R;Hayashi, T.;
gasawara, N.; Y
                                                                                                                                                                                        δõ
                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                             δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Species: Escherichia coli
;Date: 18-Jul-2001 #sequence_revision
;Accession: H91188
                                                                                                                                                         1535
                                                                                                                                                                                                                                1475
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1009
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
les 162; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ECS4480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TNDSKEFVDPYIVVTLKAGDNLKIKQNT---NENTNASSFTYSLKKDLTGLINVET--EK
                                                                                                                                                     ASMASIGGTYNGESAVALGVSMVSANGRWVYKLQGSTNSQGEYSAALGAGIQW
                                                                                                                                                                                        KSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                              NNNDVVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGTASAMAMTGLPQAYTPG
                                                                                                                                                                                                                                                                                                       NVAAGKNATDAVNVAQLKSSEAGGVRYDTKADGSIDYSNITLGGGNGG-TTRISNVSAGV
                                                                                                                                                                                                                                                                                                                           N---GKNIDIATSMTPQFSSVS1GAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGV
                                                                                                                                                                                                                                                                                                                                                                               KYFKTNTDGVDASAQGKDSVAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                        VAAGSADTDAVNVGQLKVTDAQVSQNTQSITNLDNRVTNLDSRVTNIENGIGDIVTTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --TGQADKFETVTSGTKVTFASGNGTTATVSKDDQ-----GNITVKYDVNVGDAL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GIAIGSNAQVIHVNSIAIGNGSTTTRGAQTNYTAYNMDAPQNSVGEFSVGSADGQRQITN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DTVEFLSADTKTTTVNVESKDNGK----KTEVKIGAKTSVIKEK------DGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TNVTNDNV-----TDDEKKRAASVKD-----VLNAGWNIKGVKPGTTASDNVDFVRTY 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LSF-----GANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGA-T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEDSTDAVNG - - - - SQLNATNMMIEQNTQIINQLAGNTDATY - IQENGAGINYVRTNDDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TAPTYTIANAEYNNV-GDALDALDDNALLWDETANGGAGAYNASHDGKASIITNVANGSI 1008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TVKTAVLATLLFATVQANATDEDEEEEL--ESVQRSVVGSIQASMEGSVELET--ISLSM
                                                                                                                                                                                                                                                                   KEGDVTNVAQLKGVAQ------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QNAIGAVATTPTKYFHANSTEEDSLAVGTDSLAMGAKTIVNGDKGIGIGYGAYVDANALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TSITENGVVIGYDTTDGELLGALSIGDDGKYRQIIN------VADGSEAHDAVT-VRQL 1175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LAFNDASAQGVGATAIGYNSVAKGDSSVAIGQGSYSDVDTGIALGSSSVSSRVIAKGSRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Yasunaga,
                                                                                                                                                                                                                                                                                                                                                                                                                   --NVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM---DETVNINAGNNIEITR 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Makino, K.; Ohnishi, M.;
Yasunaga, T.; Kuhara, S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12.7%;
24.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ·NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 379.5; DB
Pred. No. 3e-11;
4; Mismatches 2
                                                                                                                                                                                                                                                                   -NLNNRIDNVNGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18-Jul-2001 #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Kurokawa, K.; Ishii
Shiba, T.; Hattori,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             289;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ishii, K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels 109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3
                                                           subsp.
     09-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Yokoyama,
Shinagawa,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               02-Nov-200
                                                                                                                                                       1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       coli 0157:H7
                                                           enterica
                                                                                                                                                                                                                                                                                                      1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1123
                                                                                                                                                                                                                                                                                                                                                                             1415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         88
                                                                                                                                                                                                                              1534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        F. 7.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23;
                                                             serovar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C
```

```
C;Accession: AC0976

R;Parkhill, J; Dougan, G.; James, K.D.; Thomson, th, T.; Connerton, P.; Cronin, A.; Davis, P.; Davis, S.; Moule, S.; O'Gaora, P.

Nature 413, 848-852, 2001

A;Authors: Parry, C.; Quail, M.; Rutherford, K.;
A;Title: Complete genome sequence of a multiple d
A;Reference number: AB0502; PMID:11677608
                                В
                                                              QΥ
                                                                                                         ₽
                                                                                                                                      Qy
                                                                                                                                                                               B
                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Cross-references: GB: AL513382; PIDN: CAD03303.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type: DNA A; Residues: 1-1107 < PAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Accession: AC0976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
502
                                                                                                         862
                                                                                                                                                                                 802
                                                                                                                                                                                                                                                       742
                                                                                                                                                                                                                                                                                                                               687
                                                                                                                                                                                                                                                                                                                                                                                                   627
                                                                                                                                                                                                                                                                                                                                                                                                                                       305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             27 TKRASATVKTAVLATLLFATVQANATDEDEEEEL-ESVQR-----SVVGSIQASMEGSVE
                                VSVGSSTQQR--RITNVAAGVNNTDAVNVAQLKASEAGSVRYETNADGSVNYSVLNLGDG
                                                                                                                                                                               SVGSEDGQRQITNVAAGSADTDAVNVGQLKVTDAQVSRNTQSITNLNTQVSNLDTRVTNI
                                                                                                                                                                                                                     SKGKMD---ETVNINAGN------NIEITRNGKNI----
                                                                                                                                                                                                                                                       IGLNTLYMADAINGIAIGSNARANHANSIAMGNGSQTTRGAQTDYTAYNMDTPQNSVGEF
                                                                                                                                                                                                                                                                                         DALNVNQLQN--SGWNLDSKAVAGSSGKVISGNVSP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SVKDVLNAGWNIKGVKPGTTASDNVDFV---RTYDT----VEFLSADTKTTTVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VAAGALSEDSTDAVNGSQLYETNQKVDQNTSAIAD--INT-SITNLGTDALSWDDEEGAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DTKGLNFAKETAGTNG----DTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DIAANTTNITQNSTAIENLNTSVSDINTSITGLTDNALLWDEDTGAFSANHGGSTSKITN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LSSDNLSWNETTNSFSASHGSSTTNKITNVAAGELSEESTDAVNGSQLFETNEKVDQNTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LETISLSMTNDSKEFVDPY----IVVTLKAGD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TFSASRNGSASKITNLAAGTLAADSTDAVNGSQLYETNQKVDQNTSAIADINTSI---TN
                                                                      LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLK----
                                                                                                        ENGIGDIVTTGSTKYFKTNTDGADANAQGADSVAIGSGSIAAAENSVALGTNSVADEANT
                                                                                                                                                                                                                                                                                                                               DAVTVRQLQNAIGAVTTTPTKYYHANSTEEDSLAVGTDSLAMGAK-----TIVNADAGIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ENGTGYKYIRTNDNGLEGQDAYATGNGATAVGYDAVASGAGCLALGQNSSSSIEGSIALG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SASHGTSGTNKITNVAAGEIASDSTDAINGSQLYETNMLISQYNESISQLAGDTSETYIT
                                                                                                                                             ----DIATSMTPQF---
                                                                                                                                                                                                                                                                                                                                                                                                   SGSTSNRAITTGIRETSATSDGVVIGYNTTDRELLGALSLGTDGESYRQITNVADGSEAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative 111;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -VESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKG---KGENGSSTDEG----
-----GVAQ-------NLNNRIDNVNGNARAGIAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                       ----EGLV----TAKEVIDAVNKA----GWRMKTTTANGQTGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -NASSFTYSLKKDLTGLI-----NVETEKLSFGANGKKVNIIS
                                                                                                                                                                                                                                                                                                                                                               -ADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 373.5; DB 2; Pred. No. 3.7e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            K.D.; Thomson, N.R.; Pickard, D.; Wain, J
Davis, P.; Davies, R.M.; Dowd, L.; White,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                            -SSVSLGAGADAP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; Simmonds, M.; drug resistant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PID:g16504923;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                            TLSVDDE-GA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -NLKIKQNTN 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   295;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Skelton, J.;
Salmonella e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSPDB:GN0017.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                   979
                                                                                                                                                                               861
                                                                                                                                                                                                                                                                                                                                                                   377
                                                                                                                                                                                                                                                                                                                                                                                                                                       335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 80
                                                                                                                                                                                                                   437
                                                                                                                                                                                                                                                                                           411
                                                                                                                                                                                                                                                                                                                             741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        enterica se
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              J.; Church
e, N.; Farr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   31;
```

980

SGGTTRIGNVSAAVNDTDAVNYAQLKRSVEEANTYTDQKMGEMNSKIKGIENKMSGGIAS

1039

```
R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; Abriones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H. as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S. submitted to GenBank, June 2000
A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frohm J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laiguchado, M.A.; Madeira, H.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, F.A.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.R. Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A.Authors: da Silva, A.G.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silvai, R.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; A.Reference number: A59328
A, Contents: annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Residues: 1-1190 <SIM>
A;Cross-references: GB:AE004017; GB:AE003849; NID:g9107083; PIDN:AAF84783.1; GSPDB:GN00A;Experimental source: strain 9a5c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Title: The genome sequence of the plant pathogen Xylella fastidiosa. A;Reference number: A82315; MUID:20365717 A;Note: for a complete list of authors see reference number A59328 below A;Accession: A82615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         surface protein xF1981 [imported] - xylella fastidiosa (strain 9a5c)
C;Species: Xylella fastidiosa
C;Date: 118-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
C;Accession: A82615
                                                                                                                            Š
                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           R; anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Nature 406, 151-157, 2000\,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ş
õ
                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
Matches 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1100
   284
                                                                 835
                                                                                                                                                                                                    786
                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                    726
                                                                                                                                                                                                                                                                                                                                                                                                     166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ESVDLKNSDGNLLITKTTDSND------VTFNLATALKVDSLTTGNTAMTTDGVTVGSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VTSSGISAGNQKITNVAAGTADTDAVNFSQLQAVSSTASKGWNLLA---SGANSSNVVPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEELESVQRSVVGSIQASME
KDGKLVTGKGKGENG-SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV 342
                                                                                                                                                                                                                                                           IGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG-WNIKGVKPGTTASD----
                                                                                                                                                                                                                                                                                                                             LASGANSSNVAPGESVDLKNTDGNIVISKESGSNDVLFNLSSSLKLDKLTVGDTVMTTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              L----TGLI-----NVETEKLSFGANGKKVNI---ISDTKGLNFA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSVELE - - - - TISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENTNASSFTYSLKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | :| | | | | | | | | : | : | | | | : | | | | : | | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | : | | : | : | | : | : | | : | : | | : | : | | : | : | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGA
                                                              SQLNTAMAGSGAKSVHYYSTYD-----GGTQGGNYNGDGATGTRSIAVGVGTLASA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTLGSTGLVITDGPSVTSSGISAG-NQKITNVAAGTADTDAVNFSQLQAVSSTASKGWNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AIGAGFQW 1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                             -TVGSGVTLGSMGLVITDGPSVTSSGI----NAGSQKITNVAAGTADTDAVNL
                                                                                                                            -NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12.4%; Score 371; DE 23.4%; Pred. No. 5.56 tive 96; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 2; 1
5.5e-11;
hes 249;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 1190;
                                                                                                                                                                                                                                                                                                                                                                                              TNGDTTVHLNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1099
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 584
                                                                                                                                                                                                                                                                                                                             785
                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   666
                                                                                                                            283
                                                                                                                                                                                                                                                           236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Cross-
C;Geneti
A;Gene:
                               멍
                                                                                         Q
                                                                                                                                                           Ъ
                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Molecule type: DNA
A; Residues: 1-658 < KUR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Title: Genome sequence of Yersinia pestis, the causative agent A;Reference number: AB0001; MUID:21470413; PMID:11586360 A;Accession: AH0110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Cross-references:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1032
                               393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             399
```

GB:AL590842; PIDN:CAC89747.1; PID:g15978974; GSPDB:GN00175

of plague

C092)

o 3

```
C;Accession: AH0110
R;Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, 11, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barr. Nature 413, 523-527, 2001
                                                                                                                                                                                                 probable surface protein (partial) YPO0902 [imported] - Yersinia pestis (st
C;Species: Yersinia pestis
C;Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1150 QSAIAVGVSSVSESGRWVFKFSGSANTRSQVGIGAGVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYGTYSYGDASKGETRTYS-----NVADAKEAT--DAVNLRQLDRYAQDANRYYDNKIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NVSQLNQGLITAKQYTDGVVGSLRRDTDGGVAAAIATANLPQAYIPGRGMTSVGVSSYRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NVAQLKGVAQNLNNRIDNVNGNAR----AGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGADSIAMGNKASASADNAVAIGNHSVADRANTVSVGSAGSER---QVTNVAAGTADTDAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQL----QNSGWNLDSKAVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -EGATAVGSGAAASGKGSTAIGRNAVASADGSVALGD-GAKDGARGAESYTGKYSGLQNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --PTLSVDDEGAL-----NVGSKDANKPVRITNVAPGVKEGDVT
                                                                                                                                                                                                                                                                                     (partial) YP00902 [imported] - Yersinia pestis (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----VKVNSLNN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----SATPIAAGVDATAIGVGATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                551
```

Query Match
Best Local Similarity
Matches 138; Conserv NTNENTNASSFTYSLKKDLTGLINVE----TEKLSFGANGKKV---NIISDTKGL---NF AVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVN 375 LTAVGDQVQQNTANITSLGGRVTTIEGSMASIANGGGVKYFHANSTQPDSVASGTNSVAI ----AASINTVGAQSSYSAYALTAPQASVGELGIGTALGNRKITGVAAGSASSDAVNVAQ EKKRAASVKDV----ALVGAAATGGIAI----GFGTQVTAAGATAIGSAAQAQGAQSLALGAGAVTSQANSIALG-STSTDAVVGSQLYNLVQDGTRYFHANSVNPTDSLASGLETIAVGPATVVSGDNGVGIGNT ---TYDTVEFLSADTKTTTV--NVESKDNG--10.8%; Score 321.5; DB 2; ilarity 23.0%; Pred. No. 7.5e-09; Conservative 71; Mismatches 214; NYIGKYSNASNTSSGTVSVGNTATGETRTVSNVADG -----KEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVID ---LNAGW-----NIKGVKPGTTASDNVDFVR -DMLLNTGATTNVTNDNVTDD ----KKTEVKIGAKTSVI Indels Length 177; έ Gaps 315 345 281 285 242 229 173 164 21;

```
J.D.; Junqueira, W.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuranae, E.E.; Laig chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, A.A.thors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y., F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D. Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasa, A.J. akhors: da Silva, A.M.; Silva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Experimental source: strain 9a5c R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S. submitted to GenBank, June 2000 A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Froda, A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Franc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Title: The genome sequence of the plant pathogen A;Reference number: A82515; MUID:20365717 A;Note: for a complete list of authors see reference A;Accession: C82672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface-exposed outer membrane protein XF1516 [imported] - Xylella fastidiosa C;Species: Xylella fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QY
γO
                                                                                                 В
                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ОĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Contents: annotation C; Genetics: A; Gene: XF1516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Molecule type: DNA
A; Residues: 1-1004 <SIM>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C;Accession: C82672
R;anonymous, The Xylella fastidiosa
Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Cross-references: GB:AE003981; GB:AE003849; NID:g9106543; PIDN:AAF84325.1; GSPDB:GN00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ;Species: Xylella fastidiosa;Date: 18-Aug-2000 #sequence_revision
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
     209_KKRAASVKDVL--
                                                                                                      166 MASELNVISVGGG-
                                                                                                                                                                                                        149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KNIDI - - ATSMTPQFSSVSLGAGADAPTLS - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EITRNG
                                                                                                                                                                                                        NGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NKIYRIIWNSALNAWVAVSELTRNH-----TKRASATVKTAVLATLLFATVQANATDED 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QPYTSGSSMTTIGAASYRGQSALSLGVSSISDSGRWVSKLQASSNTQGDFGIGVGVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NVAPATQGTDAVNFDQLKSISNQTNAYTNQRYSELKQDLRKQNSVLSAGIASAMSMASLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NVAPGVKEGDVTNVAQLKGVAQN----LNNRIDNVNGNAR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ANSATGGAGSVASGNNSTAFGSGAKATAANSAALGANSVADRANSVSVGSVGNER--QIT
                                                                                                                                                                                                                                                                                                               IAIGYFSKAFAPNAIALGYNSSVTQSANNGVALGSNSTVS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EEEELESVQRSVVGSIQASMEGSVELE---TISLSMTNDSKE-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NQIYRKFWNLSLGSWSVASHMTNDGGCSDVVLRHSGVRNRSLVLAIGLALTSVTHA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                            --FVDPYIVVTLKAGDNLKIKQNTNENTN-ASSFTYSLKKDLTGLINVETEKLSFGA 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -QSVKSPAMVTASKVMVAHVDSQVNRTADRIPTGDGSELMTHMALDWKFFPFGNNS 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8.6%;
22.1%;
                                                                                                 --DGVTGPAVRRIVNVG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                - IAASIVVVENNVSGLQNGTDGMFQVNNSSGLAKPSATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     90;
     NAGWNIKGVKPGTTA-SDNVDFVRTYDTVEF--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 256; DB 2;
Pred. No. 2.4e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Consortium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      see reference number A59328 below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20-Aug-2000 #text_change 20-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----VDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     of
                                                                                                            DGIGNNDAVNKSQLDGVTASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   xylella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 1004;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Organization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels 200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -AGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                               -- GVNSVALGAGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                               165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Seque
```

```
R;Cartwright, P.; Timms, M.; Lithgow, T.; Hoj, P.; Hoogenraad, N. Blochim. Blophys. Acta 1153, 345-347, 1993
A;Title: An Escherichia coli gene showing a potential ancestral relationship A;Reference number: I52440; MUID:94100243
A;Accession: I52440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
A;Description: probably involved in protein translocation C;Keywords: nucleotide binding; P-loop F;712-719/Region: nucleotide-binding motif A (P-loop)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Title: The complete genome sequence of Escherichia A;Reference number: A64720; MUID:97426617 A;Accession: A64905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R;Blattner, F.R.; Plunkett III, G.; Bloch, C.A.;
A.; Rose, D.J.; Mau, B.; Shao, Y.
Science 277, 1453-1462, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N; Alternate names: protein 'C; Species: Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          맒
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                  A; Molecule type: DNA
A; Residues: 689-883, 'K', 885-1316, 'S', 1318-1325 <RES>
A; Cross-references: EMBL: X73295; NID: g312392; PIDN: CL
A; Note: the difference in length is due to a framesh
                                                                                                                                                                                                                                                                                                                            A;Cross-references: GB:AE000248; GB:U00096; NID:g1787783; PIDN:AAC74583.1; PID:g17877
A;Experimental source: strain K-12, substrain MG1655
R;Cartwright, P.; Timms, M.; Lithgow, T.; Hoj, P.; Hoogenraad, N.
                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type:
A; Residues: 1-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ydeK protein - Escherichia
                                                                                                                C; Genetics:
                                                                                                                                                                                                                         A;Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Status: nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Accession:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Date: 12-Sep-1997 #sequence_revision 17-Sep-1997 #text_change 02-Feb-2001 Accession: A64905; I52440; S34315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  215 NDVAASVKTIALTNQVTGSSVASASGKESTAIGSGAQAVADN------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVSGKDSIALGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GHFGA-SASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NKSQLDGVTASVNDVAASVKKIVGTIQITGSGVASAIGKDSTATGASAQAVGDSSVALGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NVAQLKGVAQNLNN---RIDNVNGNAR---AGIAQAI---ATAGLVQAYLPGKSMMAIG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSSALGVDGHALGANSTALGGQSTAISEGGTSLG---YNSFVGQSATNGIALGSN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QGVDSVALGSGSMASEPNVVSVGSGDGLRGPAVRRIVNVGDGIGNNDAVNKSQLDGVTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EKDGKLVTGKG---KGENGSSTDEGEGL--VTAKEVI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAVGASALGFDSHAKGINSTTVGTQSVSLGQGGVSLGYNSFVGEGSFNGLALGSNSLVLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RATANAIGSSVLGVDSRARGINSTALGRQSNAIGDGSVSLGFNSFVRQSGEHGVALGTDA 666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ---AIVSGVNSVALGAGSVASELNV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD-ANKPV--RITNVAPGVKEGDVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VNDVVASVKNIAGAIQITGSGVASVSGQDSTAAGASAQAAGDSSIA----LGARSRANAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ANGQTGQADKFETV--TSGTKVTFASGNGTTAT-VSKDDQGNITVKYDVNVGDALNVNQL
                                                                                                                                                                                                                                                                                                                                                                                                     1-1325 <BLAT>
                                                                                                                                                                                                                                                                                                                                                                                                                            UNA
                                                                                                                                                                                                                                                                                                                                                                                                                                               acid sequence not shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -GGTYLGEAGYAIGYSSISAGGNWIIK-----GTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       - ISVGGGDGVTGPAVRRIVNVGDGIGNNDAV
                                                                                                                                       to a frameshift
                                                                                                                                                                                                                                                                                                                                                                                                                                                 translation
                                                                                                                                                              PIDN:CAA51730.1; PID:g312393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----NGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Perna,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----DAVNKAGWRMKTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                 not shown
                                                                                                                                       error
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N.T.; Burland,
                                                apparatus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -TVAFGGRAIA
                                                                                                                                         at pos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Riley, M.;
                                                                                                                                                                                                                                                                                            б
```

```
A:Status: preliminary
A:Molecule type: DNA
A:Molecule type: DNA
A:Mosidues: 1-1536 <BAR>
A:Cross-references: GB:U08876; GB:M84616; NID:g475770; PIDN:AAA20527.1; PID:g475771
A:Note: sequence inconsistent with the nucleotide translation
A:Note: sequence extracted from NCBI backbone (NCBIN:89235, NCBIP:89239)
                                                                                                                                                                                                                                                                                                                high-molecular-weight surface-exposed protein c;Species: Haemophilus influenzae C;Date: 10-Mar-1993 #sequence_revision 18-Nov-C;Accession: A43855
R;Barenkamp, S.J.; Leininger, E.
                                                                                                                                                                                                                                                                                                                                                                                                         A43855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        рЬ
                                                                                                                                                                                                                           A; Reference number: A43855;
A; Accession: A43855
                                                                                                                                                                                                                                                                  detella pertussis.
                                                                                                                                                                                                                                                                               Infect. Immun. 60, 1302-1313, 1992
A; Title: Cloning, expression, and DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity Matches 153; Conser
                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      113
 69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                     Local Similarity
                                                                 Match
                                                                                                                                                                                                                                                                                                                                                                                                                            12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              سر
GSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLK----AGDNLKIKQNTNENTNAS 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGTYLGEAGYAI------GYSSISAGGNWIIKGTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGATLNSTGYGFIGGNASGKGIVNISTDSLWNLK-TSSTNAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVGNLNISDGG--KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNFGSGIVNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLP--GKSMMAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LGTNLGYDGHGEMNISNQGLVVSNGGSSLGYGETGVGNVSITTGGMWEVNKNVYTTIGVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV-----GSKDANKPVRITNVAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DSVITVRRLYNGYFGNG---TVNISNNGLINNKEYSLVGVQDGSHGVVNVTDKGHWNFLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FETVTSGTKVTFASGNGTTATVSKDDQGNITVK-YD-VNVGDALN--VNQLQNSGWNL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WLIKNNDSSIEFQIGNQGTGEATIREGGLVTAENTIIGGNATG----IGTLNVQ----DQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVIKEKDGKLYTGKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----TTITTSVIGANEDSEGTVNVLGGTWRLYDSGNNARPLNVGQSGTGTLNIKQKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KQNTNENTNASSFTYSLKKDLTGLINV--ETEKL-SFGANGKKVNI-ISDTKGLN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ESVQRSVVGSIQASMEGSVELETISLSMTN-DSKEFVDPYI-----VVTLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MNRIYRVIWNCTLQVFQACSELTRRAGKTSTVNLRKSSGLTTKFSRLTL--
                                  142;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGEAFRYIYIGDAGDGELNVSSEGKVDSGIITAG---MKET---GTGNITVKDKNSVITN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HVDGGYLRLGSSTGGVGTVNVEGEDSVLTTELFEIG-SYGTGSLNITD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----FAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----GVLLALSGSASGA-SLEVDNDQITNIDTDVAYDAYLVGWYGTGVLNILAGGNASL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                  Conservative
                                                                                                                                                                                                                                                                                               Leininger,
1302-1313,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN-----NIEITR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            23.8%; ***
                                                 7.78;
                                                                                                                                                                                                                                              MUID:92192797
                                                                                                                                                                                                                                                                                                   E.
1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----YVTSSIVA-----ILGYQAGSNGQVVVEKGG--E
                                90;
                                Score 231; DB
Pred. No. 0.00
90; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pred. No. 0.00015; 79; Mismatches 259
                                                                                                                                                                                                                                                                               sequence
                                                                                                                                                                                                                                                                                                                                                      18-Nov-1994
                                DB 2; 1
).00075;
les 215;
                                                                                                                                                                                                                                                                                                                                                                                       HMW1 -
                                                                                                                                                                                                                                                                               analysis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  259;
                                                                                                                                                                                                                                                                                                                                                  #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  579
                                                                                                                                                                                                                                                                                                                                                                                       Haemophilus influenzae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               554
                                                                Length 1536;
                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                of
                                                                                                                                                                                                                                                                               genes
                                160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                151;
                                                                                                                                                                                                                                                                                                                                                    08-Oct-1999
                                                                                                                                                                                                                                                                               encoding nontypeable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             203
                                33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29;
                                                                                                                                                                                                                                                                           . на
                                                                                                                                                                                                     R.Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yogasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shi DNA Res. 8, 11-22, 2001

A;Title: Complete genome sequence of enterohemorrhagic Escherichia A;Reference number: A99629; MUID:21156231; PMID:11258796

A;Recession: E90893

A;Status: preliminary A;Status: preliminary A;Molecule type: DNA A;Residues: 1-1343.

A;Molecule type: DNA A;Residues: 1-1343.

GB:BA000007; PIDN:BAB35540.1; PID:g13361583; GS A;Cross references: GB:BA000007; PIDN:BAB35540.1; PID:g13361583; GS A;Cross references: GB:BA000007; PIDN:BAB35540.1; PID:g13361583; GS A;Cross references: Strain O157:H7, substrain RIMD 0509952
                                                                                                                                                                      A;Experimental source:
C;Genetics:
A;Gene: ECs2117
                                                                                                                                                                                                                                                                                                                                                                                                      hypothetical protein ECs2117 [imported] - Escherichia coli (strain O157:H7, C;Species: Escherichia coli C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 18-Jul-2001 C;Accession: E90893
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                뫄
                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                    Query
Best I
                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                253
                                                                                                      Local
                                                                                                                       Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTISGNT 1282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---FSIEKDLTLNATGGNITLLQVEGTDGMIGKGIVAKKNITFEGGNITFGSRKAVTEIE
                                                 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDIGGTISGGTVEVKATESLTT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SSSGSVTLTATEGALAVSNISGN-----TVTVTANSGALTTLAGSTIKGTESVTTSSQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADAPTLSVD-DEGALNVGSKDANKPVRITNVAPGVKEGDVTNVA--QLKGV-AQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIAT---SMTPQFSSVSLGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VTFNQVKDSKISADGHKVTLHSKVETSGS-----NNNTEDSSD----NNAGLTIDAKNV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YTF-----ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVA 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DSDATNNANLTIKTKELKLTQDLNISGFNKAEITAKDGSDLTIGNTNSADG----TNAKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SSTDEGEGLVTAK----EVIDAVNKAGWRMKTTTAN------GQTGQADKFETVTSGTK 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             THKNGDLHITHE -- GSDTEMQIGGDVS -- - QKEGHLTISSDKINITKQITIKAGVDGENS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGK------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NFKAITNFTFNVGGLFDNKGNSNISIAKGGARFKDIDNSKNLSITTNSSSTYRTIISGNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SVKDVLNAGWNIKGV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNVTINNNANVTLIGSDFDNHQKPLTIKKDVIINSGNLTAGGNIVNIAGNLTVESN----A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GDTTVHLNG----IGSTL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SFTYSLKKDLT-----GLINVETEKLSFGANGK----KVNIISDTKGLNFAKETAGT--N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GNISVSGGGSVDFTLLA-----SSSNVQTPGVVINSKYFNVSTGSSLRFKTSGSTKTG--
                MNRIYRVIWNCTLQVFQACSELTRRVGKTSTVNLRKSSGLTTKFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----TVNNNITSHK-----AVSISATSGEITTKTGTTINATTGNVEITAQTGSILGGIE
                                                                                    154;
                                                                                                    Similarity
                                                                                    Conservative
                                                                                                  7.6%;
                                                                                    76;
                                                                                  Score 226.5; DB 2;
Pred. No. 0.0011;
6; Mismatches 258;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -QSNSKIKATT--GEANVT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KPGTTASD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -TDMLLNTGATT---NVTN--DNVTDDEKKRAA 213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----NVDFVRTYDTVEFLSA
                                                                                                                     Length
                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SATGT - - IG
                                                                                                                     1343;
                                                                                    157;
                                                                                                                                                                                                                                                                                                                                                                   ; Yokoyama,
Shinagawa,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --GENG
                                                                                                                                                                                                                             GSPDB:GN00154
                                                                                                                                                                                                                                                                                                                                    coli 0157:H7
                                                                                                                                                                                                                                                                                                                                                                                                                                                           0157:н7,
                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          848
                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        905
                  45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  791
```

Han,

and ٥

31;

substrain

```
QY
                                                                                                                                                                                                                                                                C;Genetics:
A;Gene: sapA2
                                                                                                                                                                                                                                                                                                      A;Molecule type: DNA
A;Residues: 1-1109 <DMO>
A;Residues: 1-109 <DMO>
A;Cross-references: GB:S76860; NID:g913763; PIDN:AAB33871.1;
A;Note: this gene appeared to be silent in strain 82-40 LP3
                                                                                                                                                                                                                                                                                                                                                                                      R;Dworkin, J.; Tummuru, M.K.R.; Blaser, M.J.
J. Bacteriol. 177, 1734-1741, 1995
J. Hacteriol. 177, 1734-1741, 1995
A;Title: A lipopolysaccharide-binding domain of the A;Reference number: A56143; MUID:95204338
A;Accession: A56143
A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C; Species: Campylobacter fetus
C; Date: 03-Nov-1995 #sequence_revision
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       surface-array protein homolog sapA2 - Campylobacter
C; Species: Campylobacter fetus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
A56143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                       δã
                                                                               В
                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
В
                                                                                                                                                               Query Match
Best Local S
Matches 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Accession: A56143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       511 NVSNGATLNSTGYGFIGGNASGKGIVNISTDSLWNLK-TSSTNAQ 554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    101
    389 ATGAKTTTLDASSFGGALDADLSTSASVTSIK---GGNGNDKITIKDV-AVNVAID-GGA
                                          113
                                                                                                                                                               Local Similarity
nes 152; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GVAGVGNLNISDGG---KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNFGSGIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLP--GKSMM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQ 335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QKGHVDGGYLRLGTQAAGVGTVNVEGEDSVLTTELFEIG-SYGTGSLNITD------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LKIKQNTNENTNASSFTYSLKKDLTGLINV--ETEKL-SFGANGKKVNI-ISDTKGLNFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ESVQRSVVGSIQASMEGSV---ELETISLSMTN-DSKEFVDPYI------VVTLKAGDN
                                       KONTNENT-NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGT 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FLGTGEAFRYIYIGDAGDGELNVSREGKVDSGIITAG---MKET---GTGNLTVKDKNSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK-YD-VNVGDALN--VNQLQNSGWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --EWLIKNNDSSIEFQIGNQGTGEATIREGGLITAENTIIGGNATG----VGTLNVQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIG
                                                                                 DGSADVQNLKVNGVGAKGASVAITADKIETLNLN-TTGSQSFVSADVASISVKGNANLSL 388
                                                                                                                       DEEEELESVQRSVVGSIQASMEGSVE-LETISLSMTNDSKEFVDPYIV-VTLKAGDNLKI 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ITNLGTNLGYDGHGEMNISNEGLVVSNGGSSLGYGETGVGKVSITTGGIWEVNKNVYTTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV-----GSKDANKPVRITN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -DQDSVITVRRLYNGYFGNG---AVNISNNGLINNKEYSLVGVQDGSHGVVNVTDKGHWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -RLTLGVLLA-LSGSVSGASLEVDNGQITNIDTDVAYDAYLVGWYGTGVLNILAGGN
                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --TAGTN--GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -TTITTSVIGGNEDSEGTVNVLGGTWRLYDSGNNARPLNVGQSGTGTLNIK 153
                                                                                                                                                                                  7.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN-----NIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----GYSSISAGGNWIIKGTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----YVTSSIVA-----ILGYQANSNGKVVVEKGG
                                                                                                                                                                 78;
                                                                                                                                                               Score 225; DB 2; 1
Pred. No. 0.00098;
'8; Mismatches 221;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     03-Nov-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Campylobacter fetus S-layer protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          fetus (strain 82-40 LP3)
                                                                                                                                                                                                     Length 1109
                                                                                                                                                                 Indels 158;
                                                                                                                                                                                                                                                                                                                             PID:g913764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     08-Oct-1999
                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         109
      443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      203
                                                                                                                                                                 35;
```

```
Qy
                                                                                                                                   QΥ
                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                       δÕ
                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                     Qy
                                                     밁
                                                                                                           Вb
                                                                                                                                                                  맑
                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                        661
                                                                                                                                                                                                                                                                               602
                                                                                                                                                                                                                                                                                                          316
                                                                                                                                                                                                                                                                                                                                    546
                                                                                                                                                                                                                                                                                                                                                                277
                                                                                                                                                                                                                                                                                                                                                                                           496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           172
860
                                                                                                           755
                                                                                                                                     459
                                                                                                                                                                                            399
                                                                                                                                                                                                                                                   354
                                                                                                                                                                                                                                                                                                                                                                                                                                                 444 GNDELVIKGSTADTLQPTLTN---IEKVTIDGNTKDLTLSLKKAQSVTEL-----SFKNI
                        569 IIKGTASGN 577
                                                                                                                                                                                  NGTTATVSKDDQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDD----EKKRAASVKDVLNAGWNIKGV
                                                     AQ---VIGGAAADDALTIIGKGDTQTITASGD---LSGGTLTLTLTEATKLSSLDISG--
                                                                              DIVSVDLGGVLGTINSDANNKVSITS-----NEVTYVGSEISKNVVEITAAAGGTDLN
                                                                                                                                     PTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVT-----
                                                                                                                                                                  SATGNVTLGAVSATQGNL----TLNAGNTL-
                                                                                                                                                                                                                        NVGTATLASLEANINVSGEFKLGTTTAKGDVDFNIENVG-ALTLGAITSSTGNA-SVIIS
                                                                                                                                                                                                                                                                               LTVNNKG-AFALTGANATDLDSVKNLSVNTEGAFSIATATSLKNLNNLSLNGVSADLNSV
                                                                                                                                                                                                                                                                                                          -AVNKAGWRMKTTTANG------QTGQADKFETVTS-----
                                                                                                                                                                                                                                                                                                                                    KGKIVADKATELTINSNKVTLASDAVVQAANATKID----INAAKDTVGLTLGGVAKLTD
                                                                                                                                                                                                                                                                                                                                                                KTSVIKEKDGKLVTGKGK--
                                                                                                                                                                                                                                                                                                                                                                                           AKTYTESNGNV-----ETVNILANNATDKAYTINDESLKTINFSDVDDKG----ASVAA
                                                                                                                                                                                                                                                                                                                                                                                                                     -KPGTTASDNVDFVRTYDTVEFL--SADTKTTTVNVES-----KDNGKKTEVKIGA
                                                                                                                                                                                                                                                   -GNITVKYDV-----NVGDALNVNQLQNSGWNLDSKAVA
                                                                                                                                                                                                                                                                                                                                                                 ---GENGSSTDEGEGLVTAKEVID---
                                                                                                                                        NVAQLKGVA - - QNLN
                                                                                                                                                                   -GNITIGA-LKG
                                                                                                                                                                                                                                                                                                             -GTKVTFASG
                                                       859
                                                                                                              807
                                                                                                                                        508
                                                                                                                                                                   754
                                                                                                                                                                                               458
                                                                                                                                                                                                                          718
                                                                                                                                                                                                                                                      398
                                                                                                                                                                                                                                                                                  660
                                                                                                                                                                                                                                                                                                             353
                                                                                                                                                                                                                                                                                                                                                                   315
                                                                                                                                                                                                                                                                                                                                                                                              545
                                                                                                                                                                                                                                                                                                                                                                                                                        276
```

hypothetical protein ydeK [imported] - Escherichia coli (strain 0157:H7, su C;Species: Escherichia coli C;Date: 16-Feb-2001 #sequence\_revision 16-Feb-2001 #text\_change 14-Sep-2001 QУ 망 QΥ A;Title: Genome sequence of enterohemorrhagic Escherichia coli O157:H7 A;Reference number: A85480; MUID:21074935; PMID:11206551 A;Accession: D85724 iller, L.; Grotbeck, E.J. Nature 409, 529-533, 2001 R;Perna, N.T.; Plunkett III, G.; Burland, V.; Mau, B.; Glas iller, L.; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, A;Cross-references: GB:AE005174; NID:g12515159; PIDN:AAG56256.1; GSPDB:GN00145; UWGP:A;Experimental source: strain 0157:H7, substrain EDL933 A; Molecule type: DNA A; Residues: 1-1343 <STO> A; Status: preliminary C; Accession: D85724 D85724 Matches Genetics: 61 15 1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL MNRIYRVIWNCTLQVFQACSELTRRVGKTSTVNLRKSSGLTTKFS ESVQRSVVGSIQASMEGSV---ELETISLSMTN-DSKEFVDPYI-----154; Similarity Conservative 7.5%; 24.0%; 79; Score 223.5; DB Pred. No. 0.0015; 79; Mismatches 25 DB 2; 257; Glasner, anta, E.; Length 1343; Indels -VVTLKAGDN 109 153; J.D.; Rose, Potamousis, Gaps 60 45 substrain D.J.; K.; A 32; Apoda Мау ED

Qy Db

110 101

ASL--

46

LKIKONTNENTNASSFTYSLKKDLTGLINV--ETEKL-SFGANGKKVNI-ISDTKGLNFA 165

TTITTSVIGGNEDSEGTVNVLGGTWRLYDSGNNARPLNVGQSGTGTLNIK 153

----RLTLGVLLA-LSGSVSGASLEVDNGQITNIDTDVAYDAYLVGWYGTGVLNILAGGN

51:		455 545	P 64 B
544	PGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAI	487	8
486	RUGINGAR RILIIGUAG AGELMVSARGGNVUSGI-ITAGMKETGTGNLTYKUKNSYIT RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVA 	432 395	D
338 431	-DQDSVITVRRLYNGYFGNGAVNISNNGLINNKEYSLVGVQDGSHGVVNVTDKGHWN LDSKAVAGSSGKVISGNVSPSK-GKMDETVNINAGNNIEIT	283 392	상망
282 391	EWLIKNNDSSIEFQIGNQGTGEATIREGGLITAENTIIGGNATGVGTLNVQ ADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK-YD-VNVGDALNVNQLQNSGWN	232 336	Db Qy
275	KDYLNAGWNIKGYKPGTTASDNYDFYRTYDTYEFLSADTKTTTYNYESKDNGKKTEYKIG	216 204 276	5 B 5
215 203	KETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASV::	166 154	Ф

Search completed: July 3, 2002, 08:12:05 Job time: 427 sec

THIS PAGE BLANK (USPTO)

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OM protein - protein search, using sw model
              Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
         220.5
211.5
211.5
201.5
203.2
203.2
203.2
203.2
203.2
203.2
203.2
203.2
199.1
199.1
199.1
188.1
188.1
188.1
188.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
189.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  243.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        length:
length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SwissProt_40:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          105224 seqs, 38719550 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-771-382-2
2987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 July
            Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MNKIYRIIWNSALNAWVAVS....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ω
         1039
1655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2002, 08:29:38; Search time 48.34 Seconds
(without alignments)
474.182 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DВ
       YDBA_ECOLI
OMPB_RICTYA
OMPB_RICTYA
OMPB_RICTYA
OMPB_RICTYA
OMPB_RICTYA
DIGA_SERMA
SERMA
OMPB_RICTYA
SERMA
OMPB_RICTYA
SAPU_THETU
SLAP_CAUCR
ICEN_XANCT
ICEN_XANCT
PYAB_PLAKU
YPJA_ECOLI
YMJB_CAEELI
YM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YDEK_ECOLI
AG43_ECOLI
OMPB_RICCN
OMPA_RICRI
OMPB_RICRI
OMPB_RICRI
AIDA_ECOLI
HLYA_PROMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ....TASGNSRGHFGASASVGYQW
p32051 escherichia
p39180 escherichia
p39180 escherichia
p39180 router mem
p15921 rickettsia
p15921 rickettsia
p16466 proteus mir
p33666 escherichia
p16465 router mem
p95989 router mem
p95989 router mem
p95989 rickettsia
p14914 rickettsia
p14914 rickettsia
p14914 rickettsia
p15927 salmonella
p14914 rantylobact
p15320 serratia ma
p553020 router mem
p38536 t amylopull
p35928 callobacter
p18127 xanthomonas
p50493 plasmodium
p49051 bacillus an
p52143 escherichia
p34487 caenorhabdi
p34487 caenorhabdi
p34487 bacillus su
p49051 bacillus su
p49051 bacillus su
p49051 bacillus su
p50493 plasmodium
p49051 bacillus su
p4462 chlamydia t
p56867 deinococcus
p4462 chlamydia p
p49612 chlamydia p
p49612 chlamydia m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Description
    7 campylobact
0 serratia man
0 r outer mem
6 t amylopull
8 caulobacter
7 xanthomonas
3 plasmodium
1 bacillus an
3 escheriohia
6 caenorhabdi
9 shigella fl
9 shigella fl
9 shigella fl
9 chlamydia t
7 deinococcus
9 haemophilus
1 haemophilus
1 pantoea ana
2 chlamydia m
5 chlamydia m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    592
```

## ALIGNMENTS

RESULT

\_

8888	ននន	888	455	R R R	7 X X	RR	RT	RA	RA :	RA	R X	RC	R R	RL RI	RA	RA A	RA	₹ ?	RP	R OX	88	8 8	GN CE	DT	D L	AC	YDEK_
s SWISS-PROT entry is copyright. It is produced through a c ween the Swiss Institute of Bioinformatics and the EMBL European Bioinformatics Institute. There are no restrict by non-profit institutions as long as its content is	-!- CAUTION: REF.3 SEQUENCE DIFFERS FROM THAT SHOWN DUE TO A FRAMESHIFT IN POSITION 653.	<ul> <li>-i- SIMILARITY: TO E.COLI YFAL.</li> <li>-i- SIMILARITY: SOME, TO FUNGAL MITOCHONDRIAL IMPORT SITE PROTEINS ISPA2 AND MOM38.</li> </ul>	m. Biophy BCELLULAR otential)	ichia coll gene showing a potential ancest es for the mitochondrial import site prote	SEQUENCE OF 393-1323 FROM N.A.S. MEDLINE-94100243; PubMed-8274505; Cartwright P.J., Timms M.W., Lithgow T., Hoej P.B., Hoogenraad N.J.;	3:363-377(1996).	"A 570-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 28.0-40.1 min region on the linkage map.";	., Takeuchi Y., Wada C., Yamamoto Y., H	S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., S	i H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M., no K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K.,	<pre>MEDLINE=9/251357; PubMed=909/039; Aiba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Itoh T.,</pre>		[2] SEQUENCE FROM N.A.	"The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).		Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,	Bloch C.A., Perna N.T., Bur	STRAIN=KLZ / MGL655; MEDLINE=97426617: PubMed=9278503:	SEQUENCE FROM N.A.	NCBI_TaxID=562;	gamma sabartiston,	ن. لا	Hypothetical ilpoprotein ydek precursor (Oker). YDEK OR ORFT OR B1510.		01-OCT-1993 (Rel. 27, Created) 01-NOV-1997 (Rel. 35, Last sequence update)	140; P77168;	ECOLI ECOLI STANDARD; PRT; 1325 AA.

```
RESULT 2
AG43_ECOLI
                                                                                                                                               В
                                                                                                                                                                   Š
                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                              뫄
                                                                                                                                                                                                                                                                                                                                                 QY
                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                          QΥ
                                                                                                   Ър
                                                                                                                    Qy
                                                                                                                                                                                          В
                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                  멍
Ħ
                                                       멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Complete
SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PIR; S34315; S34315.
ECOGene; EG11780; ydeK.
PROSITE; PS00013; PROKAR_LIPOPROTEIN; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       entities requires
 AG43_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TIPID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hypothetical protein; Membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL;
                                                       514
                                                                             546
                                                                                                                                                396
                                                                                                                                                                                           342
                                                                                                                                                                                                                                                             339
                                                                                                                                                                                                                                                                                   233
                                                                                                                                                                                                                                                                                                         279
                                                                                                                                                                                                                                                                                                                                                    219
                                                                                                                                                                                                                                                                                                                                                                                                                                          113
                                                                                                    456
                                                                                                                         488
                                                                                                                                                                                                                 393
                                                                                                                                                                                                                                        285
                                                                                                                                                                                                                                                                                                                               204
                                                                                                                                                                                                                                                                                                                                                                          157
                                                                                                                                                                                                                                                                                                                                                                                                                     104
                                                                                                                                                                                                                                                                                                                                                                                                164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   <u>,,,</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HVDGGYLRLGSSTGGVGTVNVEGEDSVLTTELFEIG-SYGTGSLNITD-------
                                                                                                                                                                                                                                                                                                                                                                                                                                          KONTNENTNASSFTYSLKKDLTGLINV -- ETEKL-SFGANGKKVNI -ISDTKGLN -- --
                                                                                                   GVGNLNISDGG--KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNFGSGIVNVS
                                                                                                                         GVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLP--GKSMMAIG
                                                                                                                                                LGTNLGYDGHGEMNISNQGLVVSNGGSSLGYGETGVGNVSITTGGMWEVNKNVYTTIGVA
                                                                                                                                                                                             TGEAFRYIYIGDAGDGELNVSSEGKVDSGIITAG---MKET---GTGNITVKDKNSVITN
                                                                                                                                                                                                                                                           FETVTSGTKVTFASGNGTTATVSKDDQGNITVK-YD-VNVGDALN--VNQLQNSGWNL--
                                                                                                                                                                                                                                                                                   WLIKNNDSSIEFQIGNQGTGEATIREGGLVTAENTIIGGNATG----IGTLNVQ----
                                                                                                                                                                                                                                                                                                        SVIKEKDGKLYTGKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADK
                                                                                                                                                                                                                                                                                                                                                   LNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ESVQRSVVGSIQASMEGSVELETISLSMTN-DSKEFVDPYI-----VVTLKAGDNLKI
                                                                                                                                                                      NGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     D90793; BAA15190.1;
D90794; BAA15197.1;
X73295; CAA51730.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AE000248; AAC74583.1; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVLLALSGSASGA-SLEVDNDQITNIDTDVAYDAYLVGWYGTGVLNILAGGNASL
                                                                                                                                                                                                                                                                                                                                                                                             FAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nd this statement is not removed. equires a license agreement (See email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               884
1317
1325
                                                                                                                                                                                                                                                                                                                                                                                                                    -TTITTSVIGANEDSEGTVNVLGGTWRLYDSGNNARPLNVGQSGTGTLNIKQKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18
1325
19
884
1317
AA; 1:
  STANDARD;
                                                                                                                                                                                                              DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN-----NIEITR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                136514
                                                                                                                                                                                                                                         -TVNISNNGLINNKEYSLVGVQDGSHGVVNVTDKGHWNFLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ALT_INIT.
ALT_INIT.
                                                                             GYSSISAGGNWIIKGTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ALT_FRAME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              POTENTIAL.
HYPOTHETICAL LIPOPROJ
N-ACYL DIGLYCERIDE (I
N-> K (IN REF. 3).
M -> S (IN REF. 3).
4 MW; 26A3A066FA19AD7D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 243.5;
Pred. No. 9.
                                                                                                                                                                                                                                                                                                                              -YVTSSIVA----ILGYQAGSNGQVVVEKGG--E
  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Lipoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                26A3A066FA19AD7D CRC64;
  1039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        es 259;
  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LIPOPROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . Usage by and for commercial http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ΄.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (POTENTIAL)
                                                         554
                                                                              579
                                                                                                                                                                     GSKDANKPVRITNVAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YDEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         151;
                                                                                                                                                                                                                                                                                   ġ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                      487
                                                                                                                                                                                                                 432
                                                                                                                                                                                                                                                                                                         338
                                                                                                                                                                                                                                                                                                                                                     278
                                                                                                                                                                                                                                                                                                                                                                                                                       156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                          545
                                                                                                                                                455
                                                                                                                                                                                                                                         341
                                                                                                                                                                                                                                                               392
                                                                                                                                                                                                                                                                                    284
                                                                                                                                                                                                                                                                                                                               232
                                                                                                                                                                                                                                                                                                                                                                          203
                                                                                                                                                                                                                                                                                                                                                                                                218
                                                                                                                                                                                                                                                                                                                                                                                                                                          163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29;
```

```
MEDLINE-97251358; PubMed-9097040;
Itoh T., Aiba H., Baba T., Pujita K., Hayashi K., Inada T., Isono Kasai H., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T. Mizobuchi K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Wada C., Yamamoto Y., Horiuchi T.;
"A 460-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 40.1-50.0 min region on the linkage map.";
DNA Res. 3:379-392(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=ML 308-225;
Henderson I.R., Owen
Submitted (JAN-1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
STRAIN=K12 / MG1655;
MEDLINE=97426617; PubMed=9278503;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    P39180: P76360; P75614; P97241; Q46771; O1-FEB-1995 (Rel. 31, Created) 01-NOV-1997 (Rel. 35, Last sequence update) 16-OCT-2001 (Rel. 40, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Escherichia coli.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Antigen 43 pr
FLU OR B2000
 This SW:
between
                                                                                                                                                                                                                                      "Comparing the predicted and observed property in the genome of Escherichia coli K-12. Electrophoresis 18:1259-1313(1997).
                                                                                                                                                                                                                                                                                             STRAIN=K12 / EMG2;
MEDLINE=97443975; PubMed=9298646;
                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY SEQUENCE STRAIN-ML 308-225;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mau B.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Escherichia
                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 53-63
                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=89291704;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=562;
                                                                                                                                  FEMS Microbiol. Lett.
                                                                                                                                                                                                                                                                                Link A.J.,
                                                                                                                                                                                                                                                                                                                                                             43, a unique protein Escherichia coli.";
                                          ---
                                                                                                                                                            determines
                                                                                                                                                                       Henderson I.R., Meehan M., Owen P.,
Antigen 43, a phase-variable bipartite outer membrane protein,
                                                                                                                                                                                                  MEDLINE=97257509;
                                                                                                                                                                                                                                                                                                                                                                                       Purification and
                                                                                                                                                                                                                                                                                                                                               Bacteriol. 171:3634-3640(1989)
                                                                              FUNCTION: CONTROLS COLON
FUNCTION AS AN ADHESIN.
SUBUNIT: HETERODIMER OF
CHAIN) ANCHORED TO THE I
                                       SUBCELLULAR SIMILARITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complete genome sequence nce 277:1453-1474(1997).
               SWISS-PROT entry
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Shao Y.;
                                                                                                                                                            colony morphology and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         precursor (AG43) (Fluffing protein).
                                                                                                                                                                                                                                                                               Robison K.,
                                                                                                                                                                                                                                                                                                                                                                                                     0wen
                                       LOCATION: OUTER MEMBRANE ASSOCIATED.
TO ADHESIN AIDI-I AND TO BORDETELLA PERTACTIN.
                                                                                                                                                                                      9; PubMed=9103983; Meehan M., Owen P
                                                                                                                                                                                                                                                                                                                                                                                                      י
                                                                                                                                                                                                                                                                                                                                                                                         N-terminal
                                                                                                                                                                                                                                                                                                                                                                                                                PubMed=2661530;
                                                                                                                                                                                                                                                                                                                                                                       terminal sequence of complex associated w
                                                                                                                                                                                                                                                                                                                                                                                                                                           ę
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ф.;
  is copyright.
stitute of Bio
                                                                                                                                     149:115-120(1997)
                                                                                                                     COLONY FORM
                                                                                                                                                                                                                                                                                Church G.
                                                                                                                                                                                                                                                                                                                                                                                                                                           53-78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gamma
                                                                                INTEGRAL
                                                                                             THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of.
                                                                              PERIPHERAL
PGRAL OUTER M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    subdivision;
ght. It is produced through Bioinformatics and the EM
                                                                                                                                                                                                                                                                                   ×
                                                                                                                                                            autoaggregation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Escherichia
                                                                                                                       VARIATION
                                                                                                                                                                                                                                                                properties of proteins encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                            of the
with
                                                                                MEMBRANE
                                                                                             MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                           alpha subunit of antigen the outer membrane of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        coli K-12.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Enterobacteriaceae;
                                                                                                                       AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     databases
                                                                                                                                                               μ'n
                                                                                                                       AUTOAGGREGATION.
                                                                                              PROTEIN
                                                                                                                                                               Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Seki Y.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "., Isono K.,
Miki T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    D.J.,
    a collaboration - MBL outstation -
                                                                                  (BETA
                                                                                              (ALPHA
                                                                                                                                                               coli
                                                                                                                          MAY
```

the

Swiss

```
δÃ
                                                                                                                                                                                                    밁
                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                           Вb
                δÃ
                                      밁
                                                         20
                                                                               밁
                                                                                              δÃ
                                                                                                                     망
                                                                                                                                       δÃ
                                                                                                                                                            В
                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                                 Query Match
Best Local S
Matches 138
                                                                                                                                                                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL;
                                                                                                                                                                                                                                                                                                                                                                VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EcoGene;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                modified
                                                                                                                                                                                                                                                                                                                                                                                                                    VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                                                         /ARIANT
 294
                   307
                                       235
                                                           272
                                                                               177
                                                                                                   228
                                                                                                                      138
                                                                                                                                          181
                                                                                                                                                                                 121
                                                                                                                                                             85
                                                                                                                                                                                                     62
                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                            ഗ
                                                                                                                                                                                                                                                             μ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             European Bioinformatics Institute. The by non-profit institutions as long ified and this statement is not removed
                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
RLQVDAGGTATNVTLKQGGALVTSTAATVTGINRLGAFSVVEGKADNV-VLENGGRLDVL
                                                                             VKPGTVATDTV--VNTGAEGGPDAENGDTGQFVRGDAVRTTINKNGRQIVRAEGTANTTV
                                                                                                   VKPGTTASDNVDFVRT---
                                                                                                                                                                               NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                           LNTCYRLVWNHMTGAFVVASELARARGKRGGVAVALSLAAVTSLPVLAADIVVHPGE---
                   LVTAKEVIDAVN---KAGWRMKTTTANGQT
                                      VYAGGDQTVHGHALDTTLNGGYQYVHNGGTASDTVVNSDGWQIVKNG
                                                           VKIGAKTSV-
                                                                                                                                                            ISTGLEYGPDNE----ANTGGQWVQDGGTANKTTVTSG--GLQ-RVNPGGSVSDTVISAG
                                                                                                                                                                                                                      ESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AE000291; AAC75061.1; ALT_INIT.
D90838; BAA15825.1; ALT_INIT.
D90839; BAA15832.1; ALT_INIT.
                                                                                                                     -GQSLQGRAVNTTLNGGEQWMHEGAIATGTVINDK--
                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EG
                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          41
46
157
188
188
303
372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BAA15832.1;
AAB47869.1;
                                                                                                                                                                                                                                                                                                                                  ΑA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        551
1039
                                                                                                                                                                                                                                                                                                                                                                                                       20
                                                                                                                                                                                                                                                                                                                                  106841
                                                                                                                                                                                                                                                                                            . 68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                             ANTIGEN 43 BETA CHAIN.

K -> N (IN STRAIN ML 308-225).

SL -> FF (IN STRAIN ML 308-225).

T -> K (IN STRAIN ML 308-225).

T -> K (IN STRAIN ML 308-225).

V -> F (IN STRAIN ML 308-225).

V -> F (IN STRAIN ML 308-225).

A -> T (IN STRAIN ML 308-225).

A -> T (IN STRAIN ML 308-225).

N -> Q (IN STRAIN ML 308-225).

S -> N (IN STRAIN ML 308-225).

S -> N (IN STRAIN ML 308-225).

H -> Y (IN STRAIN ML 308-225).

G -> K (IN STRAIN ML 308-225).

G -> K (IN STRAIN ML 308-225).

G -> C (IN STRAIN ML 308-225).

G -> C (IN STRAIN ML 308-225).

G -> C (IN STRAIN ML 308-225).

C -> C (IN STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                 84;
                                                                                                                                                                                                                                                                                                                                         LNLVHTS
225).
QGT -> I
S -> T
Q -> L
S -> I
ETV ->
                                                                                                                                                                                                                                                                                Score 220.5;
Pred. No. 0.00
34; Mismatches
                                                                                                                                                                                                                                                                                                                                  MΨ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ANTIGEN
                                                                                                YDTVEFLSADTKTTTVN-----VESKDNGKKTE
                                                                                                                                         -ATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKG
                                                                                                                                                                                                                                                                                                                                  5170D647C8DEEBE0
                                                                                                                                                                                                                                                                                          220.5;
No. 0.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      There
                                                          IKEKDGKLVTGKGKGENGSSTDEGEG
                                                                                                                                                                                                                                                                                                                                                      STRAIN ML
                                                                                                                                                                                                                                                                                                                                                                         (IN STRAIN ML 308
                                                                                                                                                                                                                                                                                                                                             (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ALPHA
                                                                                                                                                                                                                                                                                            ; DB 1
                                                                                                                                                                                                   -----TLANHDNQIVFGTTNGMT
                                                                                                                                                                                                                                                                                                                                             REF.
                                                                                                                                                                                                                                                                                 255;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    are no resu
                                                                                                                                                                                                                                                                                                     1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CHAIN.
                  GQADKFETVTSGTKVTFA
                                                                                                                                                                                                                                                                                                                                                                                                      (IN
                                                                                                                                                                                                                                                                                                                                             ა
                                                                                                                                                                                                                                                                                                                                                               308-225)
308-225)
                                                                                                                                                                                                                                                                                                                                  CRC64;
                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                   Length 1039;
                                                                                                                                                                                                                                                                                                                                                      308-225)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               by and for
                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN
                                      -GVAGNTTVNQKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       restrictions
tent is in
                                                                                                                                                                                                                                                                                 193;
                                                                                                                                                                                                                                                                                                                                                                                                       ĭ
                                                                                                                                                                                                                                                                                                                                                                                                       308-
                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               commercial
                                                                                                                                                                                180
                                                                                                                                                                                                   84
                                                                                                                                                                                                                                          61
                                                         306
                                                                                                 271
                                                                                                                                        227
                                                                                                                                                           137
                                                                                                                                                                                                                                                            60
                  351
                                      293
                                                                              234
                                                                                                                     176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      way
                                                                                                                                                                                                                                                                                 29;
```

```
RESULT 3
OMPB_RICCN
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9KKA3; Q9KK98; Q9XC45;
16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
10-MAR-2002 (Rel. 41, Last sequence update)
01-MAR-2002 (Rel. 41, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide
                                                                                                        "The rickettsial outer membrane protein A and B genes of Rick australis, the most divergent rickettsia of the spotted fever Submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: THE 120 KDA SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION (BY
                                                                                                                                                                                                                                                                                                                                                                                        Samson
Raoult
                                                                                                                                                                                                                                                "Phylogenetic analysis of members of the genus Rickett gene coding the outer-membrane protein rOmpB (ompB)."; Int. J. Syst. Evol. Microbiol. 50:1449-1455(2000).
                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=21442074; PubMed=11557893;
Ogata H., Audic S., Renesto-Audiffren
Samson D., Roux V., Cossart P., Weiss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria; alp
Rickettsiaceae; Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             antigen) (120 k
OMPB OR RC1085.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OMPB_RICCN
                          -
                                                                                                                                                                                                                                                                                          MEDLINE=20393643; PubMed=10939649;
Roux V., Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM
STRAIN-Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Rickettsia conorii.
                                                                                                                                                                                            Stenos
                                                                                                                                                                                                         STRAIN=Malish
                                                                                                                                                                                                                       SEQUENCE OF
                                                                                                                                                                                                                                                                                                                     STRAIN-Indian tick typhus,
                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF 33-1649 FROM
                                                                                                                                                                                                                                                                                                                                                            Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                352
                       LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY). SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                  FUNCTION: THE 32 KDA I (BY SIMILARITY).
SUBCELLULAR LOCATION:
                                                                                              SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NIPDNATVQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TGHTATNT-RVDDGGTLDVR---NGGTATTVS-MGNGG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IIKGTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LTQKAVNL---NEGTLTLNDSTYTTDVIAQRGTALKLTGSTVLNGAIDPTNYTLASGATW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATAGLVQAYLPGKSMMAIGGGT----YLGEAGYAIGYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKAFSIGGGQADALMLEKGSSFTLNAG----DTATDTTVNGGLFTARGGTLAGTTTLNNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                         0.,
                                                                                                                                                                                                                                                                                                                                                            isms of evolution in 293:2093-2098(2001)
                                                                                                                                                                                             Walker D.;
                                                                                                                                                                                                           353-1655 FROM
sh 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                1 N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      578
                                    N: CELL WALL.
                                                                               BETA
                                                                                                                                                                                                                                                                                                                                 N.A.
                                                                                                                                                                                                                       N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 alpha
                                                                                                                                                                                                                                                                                                                    and Malish
                                                                                                                                                                                                                                                                                                                                                                            Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    na subdivision;
Rickettsia.
                                                                                 PEPTIDE MAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                      Weissenbach
                                       L. THIS BACTER (BY SIMILARITY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     - ALLQGGSLTGNGSVEK - SGSGTLTVSNTT
                                                                                                                                                                                                                                                                           the genus Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                     ₽.,
                                                                                                                                                                                                                                                                                                                                                                            conorii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                               SERVE AS
                                                                                                                                                                                                                                                                                                                                                                                                     Fournier P.-E.,
ch J., Claverie
                                                     BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -VLLADSGAAVSGTRSD
                                                                               A MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                            70
                                                     \mathbf{SI}
                                                                                                                                                                                                                                                                                                                                                                           prowazekii.";
                                                     COVERED
                                                                                                                                                                               Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SISAGGNW
                                                                                                                                                                                                                                                                             using
                                                                                                                                                                                                                                                                                                                                                                                                                     Barbe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein
                                                                                                                                                               group.";
                                                                                  ANCHOR
                                                     ВY
                                                                                                                                                                                                                                                                                                                                                                                                                     ۷
;
                                                                                                                                                                                                                                                                              the
                                                     Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       506
                                                     က
```

This

SWISS-PROT

entry

įs

copyright.

ij

is

produced

through

collaboration

SOOPPROPERTY TO THE PROPERTY OF THE PROPERTY O

EMBL outstation

on

```
Query Match
Best Local S
Matches 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         between the Swiss Institute of Bioinformatics and the EMBL outst
the European Bioinformatics Institute. There are no restrictions
use by non-profit institutions as long as its content is in
modified and this statement is not removed. Usage by and for com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VARIANT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   InterPro; IPR003858; rOmpA_rOmpB.
Pfam; PF02708; rOmpA_rOmpB; 1.
Antigen; S-layer; Cell wall; Complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VARIANT
   519
                                         696
                                                                                                                                                                                                                                                                                                                                           466
                                                                                                                                                                                                                                                                                                                                                                                                                      411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                261
                                                                            460
                                                                                                                                                                                         578
                                                                                                                                                                                                                                                                     526
                                                                                                                                                                                                                                                                                                                                                                                                                                                           216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         100
                                                                                                                                                                                                                              362
                                                                                                                                                                                                                                                                                                                                                                                 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
nes 139; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATITFNGTDGTGRLVLLSKNAAATDFNVTGSLGGNLKGIIEFNTVAVNGQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AE008659;
AF123721;
 RAGIAQAIATAGLVQ----
                                       S-ATNPLAEINFGSKGAANVDTVLNVGKGVNL-YATNITTTDA---NVGSFIFNAGGTNI
                                                                                                                 VLSDGDVAINELVIGNNGAVQFAHNTYLITRTTNAAGQGKIIFNPVVNNNTTLATGTNLG
                                                                                                                                                                                                                              KDDQGNITVKYDV
                                                                                                                                                                                                                                                                                                      KEVIDAVNKAGWRMKTTTANGQTGQADKFETVT
                                                                                                                                                                                                                                                                                                                                                                                                                      VPNTMTLNGNFTGDASNPGNTAG-----VITFDANGTLASASADANVAVTNNITAIEASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YAKDMVIQSANAVGQVNFRHIVDVGTDGTTAFKTAASKVAITQNSNFGTTDFGNLAAQII 410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --LKANAGANAAVIGTNNGAGRAAGFVVSVD------NGKVATIDGQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IVVTLKAGDNLKIKONTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDT 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATVQANATDEDE-----EEELESVQRSVVGSIQASMEGSVELETISLSMINDSKEFVDPY 99
                                                                        TLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNG-NA
                                                                                                                                                    KM-DETVNIN---AGNN--IEITRNGKNIDIATSMTPQ----FSSV----SLGAGADAP
                                                                                                                                                                                                                                                                                                                                           AGVVQLSGTHAAELRLGNAGSVFKLADGTVINGKVNQTALVGGALAAGTITLDGSATITG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KGLNFAKETAGTNGDTTV-HLNGIGSTLTDMLLNTGATTNVT-NDNV-TDDEKKRAASV-
                                                                                                                                                                                         --TQNNIVVDFDLAIATDQTGVVDASSLTNAQTLTINGKIGTVGANNKTLGQFNIGSSKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---KDYLNAGWNIKGVKPGTTASDNVDFVRTYD---TVEFLSADTKTTTVN----VESKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AF149110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AF123726;
                                                                                                                                                                                                                                                                 -DIGNAGG----AAALQGITLANDATKTLTLGGANIIGANGGTINFQANGGTIKLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1159
1177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             251
413
959
988
1139
353
776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                 -KKTEVKIGAKTSVIKEKDGKLVTGK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAL03623.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAF34129.1;
AAD39533.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAF34124.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         251
413
959
988
1139
176
776
1159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1492
                                                                                                                                                                                                                            -----NVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    168342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120 KAA SURFACE-EXPOSED PROTEIN.

32 KDA BETA PEPTIDE.

32 KDA BETA PEPTIDE.

9 -> A (IN STRAIN INDIAN TICK TYPH
G -> S (IN STRAIN INDIAN TICK TYPH
K -> N (IN STRAIN INDIAN TICK TYPH
V -> A (IN STRAIN INDIAN TICK TYPH
V -> D (IN STRAIN INDIAN TICK TYPH
N -> D (IN STRAIN INDIAN TICK TYPH
N -> T (IN STRAIN INDIAN TICK TYPH
N -> GH (IN STRAIN INDIAN TICK TYPH
N -> GH (IN STRAIN INDIAN TICK TYPH
N -> GH (IN REF. 3).

6 -> S (IN REF. 3).

6 -> R (IN REF. 3).
-AYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIK 571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ¥.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 212; DB 1;
Pred. No. 0.0042;
6; Mismatches 26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E49E19377D5FCE37 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       proteome
                                                                                                                                                                                                                                                                                                      -----SGTKVTFASGNGTTATVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          264;
                                                                                                                                                                                                                                                                                                                                                                                 -GKGENGSSTDEGEGLVTA 310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N TICK TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             in no way commercial
                                                                                                                                                      459
                                                                                                                                                                                                                            414
                                                                                                                                                                                                                                                                                                                                                                                                                      465
                                                                          518
                                                                                                                 695
                                                                                                                                                                                         635
                                                                                                                                                                                                                                                                   577
                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                           525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29;
```

Qy 밁 20 망 ρy В Ş 밁 δõ В Qy 망 Q Db QУ 멍 Qy В Ş

Query Match
Best Local Similarity

7.1%; 23.7%;

Matches

144;

Conservative

69;

Score 211.5; DB Pred. No. 0.0065; 9; Mismatches 26

DB 1; 263;

Length

2249; 131;

Gaps

28

```
RESULT 4
OMPA_RICRI
ALD DESCRIPTION OF THE STREET 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=90354033; PUDMECU-LILIVILLE
Anderson B.E., McDonald G.A., Jones D.C., Re
"A protective protein antigen of Rickettsia
repeated, near-identical sequences.";
Infect. Immun. 58:2760-2769(1990).
-!- FUNCTION: ELICITS PROTECTIVE IMMUNITY.
-!- FUNCTION: ELICITS PROTECTIVE MALL. THIS BA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-APR-1990 (Rel. 14, Creaceu, 01-APR-1990 (Rel. 14, Last sequence update) 01-APR-1990 (Rel. 14, Last sequence update) 16-OCT-2001 (Rel. 40, Last annotation update) 01-00T-2001 (Rel. 40, Last annotation update) 01-00T-2001 (Rel. 40, Last annotation update) (Cell surface 01-0T-2001) (rompA) (rompA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OMPA_RICRI
P15921;
REPEAT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIGNĀL
CHAIN
                                                                                          REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                        REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                       REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        use by non-profit institutions as long a modified and this statement is not removed. entitles requires a license agreement (See lor send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria; alp
Rickettsiaceae; Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; M31227; AAA26380.1; PIR; A41477; A41477.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=783;
                                                               REPEAT
                                                                                                                                                                                                                                                                                           REPEAT
                                                                                                                                                                                                                                                                                                                             REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                          REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pfam; PF02708; rOmpA_rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            InterPro; IPR003858; rOmpA_rOmpB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              804 FVASADGTG 812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SUBCELLULAR LOCATION: CELL WALL. S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PTM: GLYCOSYLATED (PROBABLE).
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VSG-----TVGGQQGNKENTVALDNGTTVKFLGNATENGNTTIAAN-STLQIGGNYTAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTASGNSRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Repeat
                                                            431
506
578
653
725
725
800
875
950
1022
1024
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2249
1180
                                                                                                430
505
577
652
724
799
874
949
1021
1093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rmatics Institute. There are no rest institutions as long as its content
   224333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Cell wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          alpha subdivision; eae; Rickettsia.
                       1 884XI
164XI) N
164XII N
164XI) N
164XII N
164X
   Œ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OUTER MEMBRANE
13 X APPROXIMAT
I (INCOMPLETE).
A9D6646C089DF087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      R MEMBRANE PROTEIN
APPROXIMATE TANDEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S-layer; Glycoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Regnery R.L.; ia rickettsii has tandemly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Usage by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TANDEM
   CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ВУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            803
```

```
RESULT 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                     Q53047;
30-MAY-2000
30-MAY-2000
                                      "The 120 kilodalton outer membrane protein (rCmp B) of F rickettsii is encoded by an unusually long open reading evidence for protein processing from a large precursor." Mol. Microbiol. 5:2361-2370(1991).
                                                                                                                                                                                                                                                                                      30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
                                                                                                                                                                       Bacteria; Proteobacteria; alpl
Rickettsiaceae; Rickettsieae;
NCBI_TaxID=783;
                                                                                                                                                                                                                                               antigen)
                                                                                                                                                                                                                                                                                                                                                                 OMPB_RICRI
                                                                                                                               STRAIN-R
                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                   Rickettsia
                                                                                                                                                                                                                                             (Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB) (rOmp B) [Contains: 120 kDa surface-exposed protein (Surface protantigen) (120 kDa outer membrane protein ompB); 32 kDa beta pepti
             SEQUENCE OF
                                                                                                                MEDLINE=92167802;
                                                                                                                                                                                                                                                                                                                                                                                                                                          632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ASGNSRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTGNANNGIVTFTGNSTVTGDIGNTNALATVNVGAGTATLGGAVIKATTTKLTNAASVLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TISVGAGTATLGGAVIKATTTKLTDAASAVKFTNPVVVTGAIDNTGNANNGIVTFTGNST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TVNVESKD---NG---KKTEVKIGAKTSVIKEKDGKLVTG----KGKGENGSSTDEGEGL
                                                                                                                                                                                                                                                                                                                                                                                                                                          TGGDNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DDEGALNYGSKDANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNRIDNYNGNARA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LT-NANAVLTGAIDNTTGGDNVGVLNLNGALSQVTGNIGNTNSLATISVGAG--TATLGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ETVNINA - - GNNIEITRNGKNIDIAT - - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VTAK----EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IKATTTKLTNAASVLTLTNANAVLTGAIDNTTGGDNVGVLNLNGALSQVTGDIGNTNSLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SAAPSKITLAGNIDGGGIITVKTDAAINGT-----IGNTNALATVNVGAGTATLGGAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---LPVTLNAGKSLTLNGN---NAVAANHGFDAPADNYTGLGNIALG----GANAALIIQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DPYIVVTLKAGDNLKIKQNTNENTNASSFTYSLKKD-LTGLINVETEKLSFGANG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVTADAADRIIKAINVAGTTPVGLNITQNTVVGSI--ITKGNL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TVQANATDE------DEEEELESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IGNTNSLATISV --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -GIAQAIATAGLVQAYLPGKSMMAIGGG------TYLGEAGYAIGYSSISAGGNWIIKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AVIKATTKLTDAASAVKFTN--PVVVTGAIDNTG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VTGNVGNTNALATVNVGAGLLQ----VQGGVVKANTINLTDNASAVTFT---NPVVVTGAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---TDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----KKVNIIS--DTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNV
                                                                                                                                                                                                                  rickettsii
             279-1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VKYDVN----VGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMD
                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                               PubMed=1724278;
             FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -GAGTATLGGAVIKATTTKLTNAASVLTLTNANAVLTGAIDNT
            N.A
                                                                                                                                                                                      alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                 1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----SMTPQFSSVSLGAGADAPTLSV
                                                                                                                                                                                                                                                                                                                                                                 Ą
                                                                                                                                                                                                    Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           - NANNGIVTFTGNSTVTGD
                                                                                B) of Rickettsia
                                                                                                                                                                                                                                                            protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                234
```

```
Š
                                                                                                                                                  В
                                                                                                                                                                           δõ
                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SQ PTTT
δÃ
                               В
                                                         δÃ
                                                                                          멍
                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DOMAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This SWI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-90136087; PubMed=2515418; Gilmore R.D. Jr., Joste N., McDonald G.A.; Gilmore R.D. Jr., Joste N., McDonald G.A.; "Cloning, expression and sequence analysis of the gene encoding 120 kD surface-exposed protein of Rickettsla rickettsli."; Mol. Microbiol. 3:1579-1586(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for contents the statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             entities
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; X16353; CAA34403.1;
    456
                                 643
                                                                                          583
                                                                                                                    369
                                                                                                                                                                             321
                                                                                                                                                                                                          476
                                                                                                                                                                                                                                     269
                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                              225
                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                   319
                                                                                                                                                                                                                                                                                                                                                                                                                                            271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    218
                                                                                                                                                                                                                                                                                                                                                                                                               110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FUNCTION: THE 120 kDa SURFACE: EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.
SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LAYER WITH HEXAGONAL SYMMETRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SWISS-PROT entry is copyright. It is produced through a sen the Swiss Institute of Bioinformatics and the EMBI
   ADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVN
                                                                                       VVDFDLAIATDQTGVVDASSLTNAQTLTINGKIGTIGANNKTLGQFNIGSSKTVLSNGNV
                                                                                                                    TVKYDV-----NVGDALNVNQLQNSGWN-----LDSKAVA----GSSGKVIS-GNV
                                                                                                                                                  AALQRITLAN---
                                                                                                                                                                             GWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT-----TATVSKDDQGNI
                                                                                                                                                                                                          AAELRLGNAGSIFKLADGTVINGKVNQTALVGGALAAGTITLDGSATITGD--IGNAGGA
                                                                                                                                                                                                                                     KTEVKIGAKTSVIKEKDGKLVTGK-----
                                                                                                                                                                                                                                                                 FTGDASNPGNTAG-----VITFDANGTLESASADANVAVTNNITAIEASGAGVVQLSGTH
                                                                                                                                                                                                                                                                                  IKG--VKPGTTASDNVDFVRTYD---TVEFLSADTKTTTVN----VESKDNG------K
                                                                                                                                                                                                                                                                                                                         NATGQVNFRHIVDVGADGTTAFKTAASKVTITQDSNFGNTDFGNLAAQIKVPNAITLTGN
                                                                                                                                                                                                                                                                                                                                                    GTNGDTTV-HLNGIGSTLTDMLLNTGATTNVTNDN--VTDDEKKRAASVK--DVLNAGWN
                                                                                                                                                                                                                                                                                                                                                                                   NAVIGTNNGAGRAAGEVVSVD
                                                                                                                                                                                                                                                                                                                                                                                                              LKIKONTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETA
                                                                                                                                                                                                                                                                                                                                                                                                                                          TGRLVLLSKHAAATNFNITGSLGGNLKGVIEFNTVAV----DGQ-----LTANAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EEELESVQR-----SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NGFIQVS-----NKSFATVKAINIADGQGIIFNTDANNANTLNLQAGGTTINFTGTDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PF02708; rOmpA_rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity 22.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IPR003858; rOmpA_rOmpB
                                 INELVIGNDGAVQFAHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAAGTNLGS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A
A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cell wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          J2 KDA BETA E
POLY-THR.
168184 MW; P7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.9%;
                                                                                                                                                  -DAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTST---
                                                             -NNIEITR-----NGKNI--DIATSMTPQFSSVSLGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  D7AB70FB7087F618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        206.5;
No. 0.(
                                                                                                                                                                                                                                     -GKGENGSSTDEGEGLVTAKEVIDAVNKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SURFACE-EXPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB
0.0078;
3s 247;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                   NGKVATIDGQVYAKDMVIQSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -VQA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1654;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             185;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NATDEDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ВУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              commercia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         109
                                                             455
                                                                                                                     409
                                                                                                                                                                              368
                                                                                                                                                                                                                                                                   475
                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                               169
                                                                                                                                                                                                                                                                                                                                                                                                                                            318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ×
                                 696
                                                                                          642
                                                                                                                                                   582
                                                                                                                                                                                                                                      320
                                                                                                                                                                                                                                                                                              268
                                                                                                                                                                                                                                                                                                                                                       224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             37;
```

697

ATNPLAEINFGSKGVNVDT-VLNVGEGVNL-YATNITTTDA---

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                  Q
                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALD DESCRIPTION OF COLUMN AND DESCRIPTION OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                             δõ
                                                                                              멍
                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                           뭥
                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 6
AIDA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AIDA_ECOLI
Q03155;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROPEP
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the European Bioinformatics Institute. The suppose of the suppose 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      diarrhoeagenic Escherichia coli strain 2787 (0126:H27), synthesized via a precursor molecule."; Mol. Microbiol. 6:1539-1546(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=2787 (0126:H27);
MEDLINE=92326638; PubMed=1625582;
Benz I., Schmidt M.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-JUN-1994
01-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.,
STRAIN=2787 (0126:H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Plasmid pIB6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Escherichia coli.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Adhesin aidA-I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     entities
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          799
                                   122
                                                                                              121
                                                                                                                                                        8
                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                 52
                                                                                                                                                                                                                                                                                                                                               _
                                                                                                                                                                                                                                                                                                                                                                                                            <u>--</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SUBCELLULAR LOCATION: Outer membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FUNCTION: THIS IS AN ADHESION ADHERENCE OF DIARRHEA-CAUSING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ö
                                ASS-
                                                                                                                                                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVAVSELTRNH-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WIIKGTASGNSRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTNIVSG-----TVGGQQGNKFNTVALENGTTVKFLGNATFNGNTTIAAN-STLQIGGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             G-NARAGIAQAIATAGLVQ----
                                                                                                                                                        VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S28634;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YTADCVASADGTG
                                                                                                                                                                                                                   TVSSGETQIVYSGRGNSNATVNSGGTQIVNNGGKTTATTVNSSGSQNVGTSGATISTIVN
                                                                                                                                                                                                                                                                                 TDEDEEEEL---
                                                                                                                                                                                                                                                                                                                                               MNKAYSIIWSHSRQAWIVASELARGHGFVLAKNTLLVLAVVSTIGNAFAVNISGTVSSGG
                                                                                              SGGIQRVSSGGV-----ASATNLSGGAQNIYNLGHASNTVIFSGGNQTIFSGGITDSTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          167;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      X65022; CAA46156.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EPITHELIAL CELLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                u and this statement is not removed. Usage by and for commercial s requires a license agreement (See http://www.isb-sib.ch/announce/an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Rel.
(Rel.
(Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S28634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ΑĄ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29, Creat
29, Last
29, Last
                                FTYSLKKDLTGLINVETEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AND SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6
18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                132271 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       111;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sequence update)
annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADHESIN AIDA-I
--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B2A00F72AC05FB34 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROTEIN NECESSARY FOR THE DIFFUSE ENTEROPATHOGENIC ESCHERICHIA COLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    203; DB 1
No. 0.0085
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1286
                                                                                                                                                                                                                                                                                 -----ESVQRSV-----
                                                                                                                                                                                                                                                                                                                                                                                                            -TKRASATVKTA--VLATLLFATVQANA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            There are no restrictions ng as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          287;
                                                                                                                                                        -VTLKAGDNLKIKQNTNENTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 1286;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                LSFGANG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the
), is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          338;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     798
                                                                                                                                                                                                                                                                                    67
                                                                                                                                                                                                                                                                                                                                                                                                            51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               way
```

=

```
AC DE BERRY RESERVED TO THE SERVED TO THE SERVED TO THE SERVED TO THE SERVED 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뭥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                             HLYA_PROMI
P16466;
01-AUG-1990
01-AUG-1990
01-NOV-1990
Uphoff T.S., Welch R.A.; "Nucleotide sequencing of the Proteus mirabilis calcium-independent hemolysin genes (hpmA and hpmB) reveals sequence similarity with the Serratia marcescens hemolysin genes (shlA and shlB)."; J. Bacteriol. 172:1206-1216(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PROMI
                                                                                                                                 SEQUENCE FROM N.A., AND SEQUENCE STRAIN-ISOLATE 477-12;
MEDLINE-90170827; PubMed-2407716;
                                                                                                                                                                                                                                                                                                                    Proteus mirabilis
                                                                                                                                                                                                                                                                                                                                               HPMA
                                                                                                                                                                                                                                        NCBI_TaxID=584;
                                                                                                                                                                                                                                                                                            Bacteria;
                                                                                                                                                                                                                                                                                                                                                                       Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               828
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VNGSLVNNKNIJLNPTKESAGNTLTVSNYTGTPGSVISLGGVLEGDNSLTDRLVVKGNTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QNDGNFILNLAENYDFETELSGSGVLVKDNTGIMTYAGTLTQAQGVNVKNGGIIFDSAVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKVI--SGNVSPSKGKMDETVNINAGN---NIEITRNGKNIDIATSMT-PQFSSV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QEGRQYVYSGATATSTVGNNEGREYVLSGGITDGTVLNSGGLQAVSSGGKASATVINEGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---KYTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQ--NSGWNLDSKAVAGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YNAMINTGGNQYIYSDGEATAAIVNTSGFQRINSG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GIASGTIVNQSGYVNISSGGYAESTIINSGGTLRVLSDGYARGTILNNSGRENVSNGGVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTASDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NISSGGIVSETTVNVSGTQNIYSGGSALSANIKGSQIVNSEGTAINTLVSDGGYQHIRNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NVTNDNVTDDEKKRAASVKDVLNAG----WNIKG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGFQRVNSGAVATGTVLSGGTQNVSSGGSAISTSVYNSGVQTVFAGATVTDTTVNSGGNQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ---KKVNIISDTKG---LNFAKETAGTNG----DTTVHLNGI-----GSTLTDMLLNTGATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ANKPVRITNVAP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SQNHASNIVLENGGLLRVTSGGTATDTTVNSAGRLRIDDGGTINGTTTINADGIVAGTNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AQFVYDGGQVTGTNIKNGGTIRVDSGASALNIALS-SGGNLFTSTGATLPELTTMAALSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FDAEVYSGGKQTVYLWRGIWYSNFLTAVWSMFPGTASGANVNLSGRLNAFAGNVVGTILN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IDAVNKAG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ISSGGQQRVSSGGVASNTTINSSGAQNILSEEGAISTHISSGGNQYISAGANATETIVNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NADMAVNQNAYINISDQATINGSVNNNGSIVINNSI--INGNITNDADLSFGTAKLLSAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            578
                                                                                                                                                                                                                                                                                              Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                             (Rel. 15,
(Rel. 15,
(Rel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVT----AKEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -DVTNVAQLKGVAQN-----LNNRIDNVNGNARAGIAQAIATAGLVQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MAIGGGT----YLGEAGYAIGYSSISAGGN-----WIIKGTAS
                                                                                                                                                                                                                                                                                                                                                                                                  Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -SLGAGAD----APTLSVDDEGALN----
                                                                                                                                                                                                                                                                                            gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -DFVRTYDTVEFLS-ADTKTTTVNVESKDN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                 subdivision;
                                                                                                                                                                                          OF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WRMKTTTANGQ - - - - TGQADKFETVTSGT - - -
                                                                                                                                                                                          30-43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1577
                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ------GVKEG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -GTAPVQNSVVVTRTVSSAAKP
                                                                                                                                                                                                                                                                                                 Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----VKPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----VGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       769
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   294
```

QΥ 밁

망

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CHAIN
SEQUENCE
                                        1095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIR; A35140; A3514
Hemolysis; Toxin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; M30186; AAA25657.1; -. PIR; A35140; A35140.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -
                                                                                                                                                                                                                                                                          926
                                                                                                                                                                                                                                                                                                                                                       867
                                                                                                                                                                                               986
                                                                                                                                                                                                                                    336
                                                                                                                                                                                                                                                                                                                                                                                                                                    823
  494
                                                                                                                                                         390
                                                                                                                                                                                                                                                                                                                                                                                           262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                616
                                                                                                                                                                                                                                                                                                                288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEFINED.
FUNCTION: CELL-E
ERYTHROCYTES BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SUBCELLULAR LOCATION: Outer membrane. MISCELLANEOUS: THE CONSERVED AMPHIPATHIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARL'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REQUIRES HPMB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SWISS-PROT entry is copyright. It is produced through the Swiss Institute of Bioinformatics and the EM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KNETNKQTST-----GSELISDAQLTVVSGNDVNVIGSLIKSADKLGIHSLGDINVKSA
                                                                                                                                                                                                                                                                                                                                                     VGVNLDYSGVTKPVKKAIEDGVNT-TKPGNNTDLTKKVTARDAIANLANLSNLETPNVGV
VTNVAQLKGVAQNLNNRID--
                                                                                                                   FTSNGDISINVGENAHYEGAQFDAQKGK--
                                                                                                                                       W--NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITR
                                                                                                                                                                                           ATLDKHQTTFHETKGGGQIGVSTKTGSDITVAIKGEGQTT-----DNALMETKAKGSQ
                                                                                                                                                                                                                                                                        EVGIKGGGSQQSQTDSQAVSTSINAGKIDIDSNNKLHDQGTHYQSTQEGISLTANTHTSE
                                                                                                                                                                                                                                                                                                              LVTGKGKGENGSSTDE---GEGLVTAKEVIDAVNK---AGWRMKTT----
                                                                                                                                                                                                                                                                                                                                                                                                                               ----KDLLHEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RAASVKDVLNAGWNIKGVKPGTTASDNVD--FVRTYDTVEFL----SADTKTTTVNV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TDNTDTTISGGFSYTGGVDKVGSKADFQYDKQHTQTEVTKNRGSQTEVAGDLTITAN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --NGDTTVH------LNGIGS-------TLTDMLLNTGATTNVTND-NVTDDEKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----STETEQANSTISGANVDLQAN-KDVTFAGSDLKTTAGNASITGDNVAFVSTENKKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGLINVETEKLSFGANGKKVNIISDTKGLNFA----KETAGT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QQVTKIDDEKTSLAITGHAKEVEDK----QYSAG--FHITHTTNKNT-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENTNASSFTYSLKKDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RNHTKRASATVKTAVLATLLFATVQANATDEDEEEELESVQRSV-----VGSI---QA
                                      ANLKVGT - -TPE - - SKDYGGGFNAGTTHHSKEQTTAKVGTITGSQGIELNAGHNLTLQG - 1149
                                                                          NIDIATSMTPQFSSVSLGAGADAPTL-SVDDEGALNVGSKDANKPVRITNVAPGVKEGD
                                                                                                                                                                                                                                  DKFETVTSGTK----VTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BE RESPONSIBLE FOR PORE FORMATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        30 15
1577 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Outer
                                                                                                                                                                                                                                                                                                                                                                                                                               ------ASHHVEGRYQESGENIQHLAVNDSETSKTDSLNVGID
                                                                                                                                                                                                                                                                                                                                                                           -ESKDNGKKTEVKIGAKTSVIKE---KD------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INTERACTION WITH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          165869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HEMOLYSIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 201;
Pred. No. 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HEMOLYSIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        175975E0C924B2D9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WHICH
H THE I
                                                                                                               TV-INAGGDLTLAQATDTHSESQSNVNGS
NVNGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RELEASES HEME-IRON ERYTHROCYTE MEMBRANI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         211;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 238;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEMBRANE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SHLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL outstation
                                                                                                                                                                                                                                                                                                              TANGQTGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AND
                                                                                                                                                       NGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                 1094
                                                                                                                                                       435
                                                                                                                                                                                           1038
                                                                                                                                                                                                                                                                          985
                                                                                                                                                                                                                                                                                                                                                     925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            669
                                                                                                                                                                                                                                  389
                                                                                                                                                                                                                                                                                                            335
                                                                                                                                                                                                                                                                                                                                                                                         287
                                                                                                                                                                                                                                                                                                                                                                                                                               866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         41;
```

QУ

B Qy Вþ δÃ В ρ В δÃ 멍 δÃ В δÃ ₽ ρy 밁 δÃ В

EMBL; AE000237; AAC74483.1; ALT\_SEQ. EMBL; AE000237; AAC74487.1; ALT\_SEQ. EMBL; D90778; BAA15009.1; ALT\_SEQ. EMBL; D90778; BAA18880.1; ALT\_SEQ. EMBL; D90779; BAA18881.1; ALT\_SEQ. EMBL; X62680; -; NOT\_ANNOTATED\_CDS. ECOGENE; EG11307; ydba.

Hypothetical CONFLICT

2680; -; NOT\_ANNOTATED\_CDS.
EG11307; ydbA.
EG11307; ydbA.
ical protein; Complete proteome
ical protein; Complete proteome
489 489 I -> V (IN

(IN

REF.

۵

modified and this statement is not removed. entities requires a license agreement (See or send an email to license@isb-sib.ch).

(See http://www.isb-sib.

.ch/announce/

Usage

and

18

way

δÕ В Š

```
Science [2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=97251357; PubMed=9097039;
Alba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Itoh Kasai H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M., Kasai H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K., Makaino K., Miki T., Mizobuchi K., Mori H., Mori T., Saito Sampel G., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito Sampel G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.; "A 570-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 28.0-40.1 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P33666; P76087; P76088; P76856; P76857; P76
01-FEB-1994 (Rel. 28, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1150
                                                                                                                                                                                                                                                                                                                                 Escherichia coli K-12.";
Biochimie 73:1361-1374(1991)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
STRAIN-K12 / MG1655;
MEDLINE-97426617; PubMed-9278503;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Hypothetical protein ydbA. YDBA OR B1401/B1405.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YDBA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=92190338;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria;
                                                                                                                                                                                                                            between
                                                                                                                                                                                                                                                                                                                                                               "Multiple IS insertion sequences
                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                541
                                                                                                                                                                                                                                                                     SIMILARITY: TO S. TYPHIMURIUM ORF NEAR CYSG (AC P25928).
CAUTION: THIS IS A CONCEPTUAL TRANSLATION; THE GENE COD
THIS PROTEIN IS INVERRUPTED BY A HYBRID IS2D/IS30C ELEM
BETWEEN AMINO ACIDS 839 AND 840.
                                                                                                                                                                                                           European Bioinformatics Institute.
                                                                                                                                                                                                                         SWISS-PROT entry is copyright. It is produced through en the Swiss Institute of Bioinformatics and the EN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complete genome sequence of Escherichia coli K-12."; nce 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                M----MAIGGGTYLGEAGYAIG---YSSISAGGNWIIKG---TASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MTDDASSVNG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -THLSSEQDIALNATNKVDLQSASSEHTEKGNNLSGGVQAGF--
                                                                                                                                                                                                                                                                                                                                                                                                                            OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FROM N.A
                                                                                                                                                                                               non-profit institutions as long
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                             Glaser P.
                                                                                                                                                                                                                                                                                                                                                                                                                         464-2003 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                                                                                                             PubMed=1665988;
P., Danchin A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    P76856; P76857; P76859;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                               near the replication
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                             There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1238
                                                                                                                                                                                                              restrictions
                                                                                                                                                                                                                                                                                                                                                                terminus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  578
                                                                                                                                                                                                                                                                                        E CODING
ELEMENT
                                                                                                                                                                                                                              igh a collaboration -
EMBL outstation -
                                                                                                                                                                                                                            outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKK 1193
                                                                                                                                                                                                                                                                                                      FOR
                                                                                                                                                                                                                                                                                                                                                                'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Τ.,
                                                                                                                                                                                                                0g
                                                                                                                                                                                               no
```

AS

Þ

MEMBRANE

ANCHOR ВY

Þ

Š

В

of

Rickettsia

```
RESULT 9
OMPB_RICJA
OXCOOR DEED DIT
                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SQ
                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                 OMPB_RICJA STANDARD; PRT; 1656 AA.

006653;
30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) [Contains: 120 kDa surface-exposed protein (Surface protein)
antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONFLICT
SEQUENCE
                 Bacteria; Proteobacteria; alp
Rickettsiaceae; Rickettsieae;
   NCBI_TaxID=35790;
                                               Rickettsia japonica.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  436
                                                                                                                                                                                                                                                                                776 YTSVIVVSGESSVYLNGDTTISG
                                                                                                                                                                                                                                                                                                             557
                                                                                                                                                                                                                                                                                                                                                                                                      659
                                                                                                                                                                                                                                                                                                                                                                                                                                    469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     55 DEEEELESVQRSVVGSIQASMEGSVELE----TISLSMTNDSKEFV------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                               VNVS-NEATGFSITTNSGKVSLAGSMQVGDFSTGVDLNGNNNSVTLAAKDLKVVGQKATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ETVNINAGNNIEITRNGKNIDIATSM-TPQFSS-VSLGAGADAPTLSVDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TGTEI-AGNNGKVI--QDGDLDVSGGGHGIDITGDSATVDNKGTMTVTDPESIGIQIDGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTMTVTDPESIGIQVDG-DQAVVNNEGESAITNGGTGTQINGDDATANNNGKTTVDGKDS
                                                                                                                                                                                                                                                                                                                                         SEVTSRQSNLFDGSAEKTSGLV-VIGDGNTVNMNGGLELIGEKNALADGSQVTSLRTGYS
                                                                                                                                                                                                                                                                                                                                                                                                    INV-SGDAN-TVNITGNVLVDKDKTADNAAEYFFDPSVGINVYGSDNNVTLDGKLTVVSD
                                                                                                                                                                                                                                                                                                                                                                                                                                  LNVGSKDANKPVRITNVAPGVKEGDVTNVAQL---KGVAQNLNNRIDNVNGNARAGI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GI---VNLDGSLTVTGGAHGVENIGDNGTVNNKGDIVVSDTGSIGVLINGEGATVSNTGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TVKYDVNVGDALNV----NQLQNSGWN--LDSK----AVAGSSGKVISGNVSPSKGKMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QAIVNNEG----ESTITNGGTG-----TQINGNDAT-ANNSGKTTVDGKDSTGTKIAGNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---VNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDD-----QGNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --TEVKIGAKTSVIKEKDGKL-VTGKGKG---ENGSSTDEGEGLVTAKE-----VIDA-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKK-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INGDDATANNNGKTTVDGKDSTGTEINGNNGKVIQDGDLDVSGGGHGIDITGDSATVDNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LNG-----IGSTLTDMLLNTGATTNVTNDNVTDD----------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDVSGGGHGIDITGDSATVDNKGTMTVTDPESMGIQIDGDKAIVNNEGESTITNGGTGTQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KWQYNHNGELVIT---GDNATV--NNNGKTTVDG-----KDSTGTEINGNNGKVIQDGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DKTEKTLTIRDSVF-TYTENADGTISLQDSNGRKATINLWQIDEANNTVALEGVSADGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----DPYIVVTLKAGDNLKIKQNTNENTNASSFTYSLKKDLTGL-IN-----VETEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              495
2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                             -GYSSISAGGNWIIKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ΑA;
                                                                                                                                                                                                                                                                                                                                                                       -AQAIATAGLYQAYLPGKSMMAIGGGTYLGE-----AGYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                495
.; 205949
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6.6%;
                 alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MW;
                                                                                                                                                                                                                                                                                798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 198;
Pred. No. 0
                                                                                                                                                                                                                                                                                                             572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -> V (IN REF. 2).
: B83A12C8B53220EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     J.025;
239;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 1;
                               Rickettsiales
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 2003;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   198;
                                                                            peptide)
                                                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       207
                                                                                                                                                                                                                                                                                                                                                                                                                                  522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   39;
                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                           Вb
                                                                                                                                     Q
                                                                                                                                                                    Db
                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DOMAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           InterPro; IPR003858; rOmpA_rOmpB.
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted (MAY-1997) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: THE 120 KDA SUFFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROFEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Uchiyama
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN-YH;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            [1]
SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; AB003681; BAA20138.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Sequencing of the gene encoding japonica.";
                 371
                                               409
                                                                                                          350
                                                                                                                                        274
                                                                                                                                                                    295
                                                                                                                                                                                                                                  251
                                                                                                                                                                                                                                                               171
                                                                                                                                                                                                                                                                                             192
                                                                                                                                                                                                                                                                                                                                                         132
                                                                                                                                                                                                                                                                                                                                                                                      132 DLT---
                                                                                                                                                                                                                                                                                                                                                                                                                    80
                                                                                                                                                                                                                                                                                                                                                                                                                                                79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30 ASATVKTAVLATLLFATVQANATDE-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY).
FUNCTION: THE 32 KDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LAYER WITH HEXAGONAL SYMMETRY.
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (BY SIMILARITY).
SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED
VTVPDTM----
                                                                 KEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITV
                                                                                                        VYAKDMVIQSANANGQVNFRHIVDVGIDGTTAFKTAASIVAITQNSNFGTTDFG-NLAAQ
                                                                                                                                      IGAKTSVIKE ---
                                                                                                                                                                    NLKGIIELNTVAINGQLIANAG
                                                                                                                                                                                                   NIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVN-----VESKDNGKKTEV--K
                                                                                                                                                                                                                                  ANALNLQAGGTTINFNGTDGTGRLVLLSKNGAATDF---NVTG-----SLGG
                                                                                                                                                                                                                                                             TN-----GDTTVHLNGIGSTLTDMLLN-TGATTNVTNDNVTDDEKKRAASVKDVLNAGW
                                                                                                                                                                                                                                                                                             TTQKAPLILADNALIVNGANGTLNVTNGFIQVSDKSFATVKAIN-IGDGQGFMFNTNATN
                                                                                                                                                                                                                                                                                                                                                        TLTITGQGITNVQSAATHNAQNIVAKFNGGAAIANNDLSGLGTIDFGAAASTLVFDLANP
                                                                                                                                                                                                                                                                                                                                                                                                                 INLNTPAGSENGLELSNANN------LAVTVSEDTTLGFINNAANNANRFNLTLDAGK 131
                                                                                                                                                                                                                                                                                                                                                                                                                                               VELET -----ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENTNASSFTYSLKK 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STATIVASFAGSAMGAAIQQNRTTNGVATTVDGVGFDQTVALANVAVAPNAVITANANNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S-layer; Cell wall
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    528
1656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1339
                                                                                                                                                                                                                                                                                                                                                                                      -GLINVE--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ĀΑ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1338
1656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  533
                                                                                                                                                                                                                                                                                                                           ---GANG----
                                               -TLTGN-FTGDANN-PGNTAGV-ITFAA-NGTLASASAD--ANVAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ormatics Institute. There are no restinstitutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    168097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       . 88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        78;
                                                                                                                                                                      ----PANAVIGTNNGAGRAAGFVVSVDNGKAATIDGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120 KDA SURFACE-EXPOSED
32 KDA BETA PEPTIDE.
POLY-GLY.
MW; 3132A69C9DD5999F CRC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 197;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein rOmp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MAY
                                                                                                                                        KDGKLVTGKGKGENGSSTDEGEGLVTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1;
.022;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -DEEEELESVQRSVVGSIQASMEGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SERVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           260;
                                                                                                                                                                                                                                                                                                                           KKVNIISDTKGLNFAKETAG
```

Length 1656;

Indels

296;

Gaps

36;

78

79

408

420 454 349 273 294 223 250 191 140 CRC64;

PROTEIN

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                        STRAIN=WILLING. 92114896; PubMed=13/00/0,
MEDLINE=92114896; PubMed=13/00/0,
Ching W.M., Carl M., Dasch G.A.;
Ching W.M., Carl M., Dasch G.A.;
"Mapping of monoclonal antibody binding sites
"Mapping of monoclonal antigens of Rickettsia type
                          membrane protein of rickettsiae: identification of an avirulent mutant deficient in processing.";
Infect. Immun. 60:159-165(1992).
-i. FUNCTION: THE 120 kDa SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.
-i. FUNCTION: THE 32 kDa BETA PEPTIDE MAY SERVE AS A MEMBRANE A SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED S-LAYER WITH HEXAGONAL SYMMETRY.
-i. SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                      [3]
IDENTIFICATION OF CLEAVAGE SITE.
MEDLINE-92104668; PubMed=1729180;
Hackstadt T., Messer R., Cleplak W., Peacock M.G.;
"Evidence for proteolytic cleavage of the 120-kilodalton outer
"Evidence for proteolytic cleavage of the 120-kilodalton outer
                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=94040787; PubMed=8224886;
Hahn M.-J., Kim K.-K., Kim I., Chang W.-H.;
"Cloning and sequence analysis of the gene encoding the surface layer protein of Rickettsia typhi.";
Gene 133:129-133(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-WILMINGTON;
MEDLINE=94040787; PubMed=822488
Hahn M.-J., Kim K.-K., Kim I.,
                                                                                                                                                                                                                                                                                 "Mapping of monocional antiporthe S-layer protein antigens prowazekii.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DMPB on December 1991.
Rickettsia typhi.
Bacteria; Proteobacteria; alph
Bacteria; Proteobacteria; alph
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  antigen) (1: OMPB OR SLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15-JUL-1998 (Rel. 36, Created)
15-JUL-1998 (Rel. 36, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide)
 This
                                                                                                                                                                                                                                                                                                                                                                                       PARTIAL SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OMPB_RICTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 96989;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NWIIKGTASGNSRGHFGASA
SWISS-PROT entry is copyright.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KNIVSGTVGGQQGNKFNTVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTNLGSAANPLAEINFGSKGARADTVLNVGEGVNL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GIAQAIATAGLVQAYLPGK-----SMMAIGGGTYLGEAGYA-----IGYSSISAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SSKTTLNGGNVAINELVIG-NNGSVQFAHNTYLITRTTNAAGQGKIIFNPVVNNNTTLAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAITLDGSATITGDIGNGGGGAALQSITLANDATKTLTLGGANIISANGGTINFQANGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TNNITAIEASGVGVVQLSGTHTAELRLGNAGSVFKLADGTV--INGKVNQTVLVGGVLAA
                                                                                                                                                                                                                                                                         Immunol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IKLTSTQNNIVVDCDLAIA-TDQTGVVDASSLTNAQTLTISGTIGIIGANNTTLGQFNIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IEITRNGKNI----DIATSMTPQFSSVSLGAGADAPTLSVDDE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -NKPVRITNVAPGVKEGDV-
                                                                                                                                                                                                                                                                       29:95-105(1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1645
 Ιt
 żs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TNVAQLKGVAQNLNNRIDNVNGNARA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ą
produced
                                                                                                                                                                                                                                                                                                     tes on
typhi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ·YATNITTTDANVGSFVFNAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rickettsiales;
                                                                                                                                                                                                                                                                                                     CNBr
and R
through a
                                                                                                                                                                                                                                                                                                       r fragments
Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                   crystalline
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NINA-GNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALNVG
 collaboration
                                                             ANCHOR
D BY A
                                                                                                                                                                                                                                                                                                                      Of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          690
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     512
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SO STATE OF THE ST
                                       Q
                                                                                    밁
                                                                                                                              Qy
                                                                                                                                                                         밁
                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                     맑
                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TRANSMEM
CONFLICT
CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and fo entities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; L04661; AAB48987.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            [nterPro;
  712
                                                                                                                                476
                                                                                                                                                                            597
                                                                                                                                                                                                                       445
                                                                                                                                                                                                                                                                 537
                                                                                                                                                                                                                                                                                                          416
                                                                                                                                                                                                                                                                                                                                                        482
                                                                                                                                                                                                                                                                                                                                                                                                 356
                                                                                                                                                                                                                                                                                                                                                                                                                                             424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AANGDSILHIGKGVNL---
                                         YLPGKSMMAIGGGTYLGEAGYA----
                                                                                                                                ANKPVRIT-NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQA
                                                                                                                                                                            GVVDASSLTNNQTLTINGSIGTIGANTKTL----GRFNVGSSKTILNAGDVAINELVME
                                                                                                                                                                                                                       PQFSSVSL
                                                                                                                                                                                                                                                                 QDITLANDASKILTLSGANIIGANAGGAIHFQANGGTIQLTSTQNNILVDFDLDVTTDQT
                                                                                                                                                                                                                                                                                                                                                     NAGSIFKLADGTV-INGPVNQNPLVNNNALAAGSIQLDGSAII--TGDI--GNGAVNAAL
                                                                                                                                                                                                                                                                                                                                                                                               TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                             DAKNINGNTAG--VITFNANGTLYSGNTDPNIVYTNIKAIEVEGAGIVQLSGIHGAELRLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DAVNK---AGWRMKTTTANGQ--TGQADKFETVTS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EHLVDVGLGGKTN-FKTADSKVII----TENASFGSTDFGNLAVQIVVPNNKILTGNFIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NGGAANAVIGTDNGAGRAAGFIVSVD-----NGNAATISGQVYAKDIVIQSANAGGQVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DG - - TGKLVLVSKNGNATEFNVTG - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGV-KPGTTA------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----GFVKVSDKTFA----GIKTINIGDNQGLMFNTTPDAANALNLQGGGNTINFNGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN-----GDTTVHLNGI 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSIDFTAAPSV----LEFNLINPTTQ-----EAPLTLGDNAKIVNGANGILNITN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKONTNENTNASSFTYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FNFTIGAGKSLTITGHGITAQQAATTKS---AQNVVSKVNAGAAINDND------LSGV 172
                                                                                    NDGSVHLTHNTYLITKTINAANQGKIIVAADPINTDTALADGTNLGSAESPLSNIHFATK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      157;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PF02708;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the Swiss Institute of Bioinformatics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EVKIGAKTSVIKEKDGKLVTGKGKGENGS--STDEG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IPR003858; rOmpA_rOmpB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1354
1415
657
842
1071
1306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -SDN-----VDFVRTYDTVEFLSADTKTTTVNVESKD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     rOmpA_rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ΑĀ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1645
1429
657
842
1071
1306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Transmembrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    169698
-YANNITTIDANVGSLHFRSGGTSIVSGTVGG
                                                                                                                                                                                                                                                                                          VNINAGNNIEITRNGKNI----
                                                                                                                                                                                                                       GAGADAPTLSVDDEGALNVGSK-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEMBRANE ANCHOR (POTEN
H -> N (IN REF. 2).
V -> I (IN REF. 2).
G -> A (IN REF. 2).
G -> S (IN REF. 2).
8 MW; OCB5641C7EB185EE C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20 KDA SURFACE-EXPOSED PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KDA BETA PEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Cell
                                             --IGYSSISAGGNWIIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           190;
No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               There are no restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -SLGGNLKGVIEFDTTAAAGKLIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  <u>ب</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        258;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GTKVTFASG-----NG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1645;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -EGLVTAKEVI
                                             576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        218;
                                                                                                                                                                                                                                                                                                            DIATSMT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -NGKKT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                       b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     n no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             89
                                                                                                                                  534
                                                                                                                                                                            651
                                                                                                                                                                                                                                                                   596
                                                                                                                                                                                                                                                                                                                                                        536
                                                                                                                                                                                                                                                                                                                                                                                                   415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                313
                                                                                                                                                                                                                       475
                                                                                                                                                                                                                                                                                                            444
                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          no
on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35;
```

```
OMPA_RICU.

OMPA_RICU.

OS2657; P95591; P9552...

C Q52670; Q52674;

T 16-OCT-2001 (Rel. 40, Created)

DT 16-OCT-2001 (Rel. 41, Last sequence update)

DT 01-MAR-2002 (Rel. 41, Last annotation update)

Onter membrane protein A precursor (190 kDa a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 11
OMPA_RICCN
STRAIN-Indian tick typhus, M1, Malish /, and my STRAIN-Indian tick typhus, M1, Malish /, and my Raoult D., Fournier P.E., Roux V.;
Raoult D., Fournier P.E., Roux V.;
Phylogenetic analysis of spotted fever group of the outer surface protein rOmpA.";
Submitted (DEC-1996) to the EMBL/GenBank/DDBJ
Submitted (DEC-1996) to the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE-94171067; PubMed-8125327;
Crocquet-Valdes P.A., Weiss K., Walker D.H.;
Crocquence analysis of the 190-kDa antigen-encoding
conorii (Malish 7 strain).";
Gene 140:115-119(1994).
                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
   EMBL;
EMBL;
EMBL;
EMBL;
                                                                             EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Differentiation of spotted fever group rickettsiae by sequencing and analysis of restriction fragment length polymorphism of PCR-amplified DNA of the gene encoding the protein rompA.";
J. Clin. Microbiol. 34:2058-2065(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-Indian tick typhus, M1, M8 MEDLINE-97015921; PubMed-8862558; Roux V., Fournier P.E., Raoult D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Mechanisms of evolution in Rickettsia
Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A. STRAIN=Malish 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A. STRAIN=Malish 7;
                                                                                                                                                                          or send
                                                                                                                                                                                          entities
                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Raoult D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Samson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ogata H., Audic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=21442074; PubMed=11557893;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                            FUNCTION: ELICITS PROTECTIVE IMMUNITY (BY SIMILARITY).
SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED
                                                                                                                                                                                                                                                                                                 SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                               S-LAYER WITH HEXAGONAL SYMMETRY. PTM: GLYCOSYLATED (BY SIMILARITY).
U01028; AAA17405.1; -...
AE008674; AAE03811.1; -...
U43794; AAB49549.1; -...
U43798; AAB49550.1; -...
U43806; AAB49551.1; -...
U43844; AAB49566.1; -...
U45244; AAB49566.1; -...
U46918; AAA86663.1; -...
U46918; AAA86663.1; -...
U83440; AAC35176.1; -...
U83443; AAC35176.1; -...
U83448; AAC35184.1; -...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        D.; Roux V., C
                                                                                                                                                                           an
                                                                                                                                                                          requires a license agreement (See http://www.isb-sib.ch/announce/an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                        953-2012 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8-204 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Renesto-Audiffren P., Fournier P.-E., Cossart P., Weissenbach J., Claverie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           alpha subdivision;
eae; Rickettsia.
                                                                                                                             .'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P95594; Q52667; Q52668; Q52669;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tion update)
c (190 kDa ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ٦,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           conorii and
                                                                                                                                                                                                                                                                                                                                                                                                                                         and Moroccan;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and Moroccan;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     antigen)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                              databases.
SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                            rickettsiae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             prowazekii.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  of Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          J.-M.,
                                                                                                                                                                                                                                                                                                                                                                                                           bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Barbe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      surface
                                                                                                                                                                                                                                                                                                                                                                                                           study
                                                                                                                                                                                                                                                                                                                                                 ЗΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ۷
;
```

```
밁
                                   δÃ
                                                    밁
                                                                  Qy
                                                                                  멍
                                                                                                 Qy
                                                                                                                В
                                                                                                                               Qy
                                                                                                                                             Matches
                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                               CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                 CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                          CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                               CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                   CONFLICT
SEQUENCE
                                                                                                                                                                                                                                CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Complete proteome. SIGNAL 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            InterPro; IPR003858; rOmpA_rOmpB.
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                                                                                                                                                                                                         CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Antigen;
                                                                                                                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                              CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DOMAIN
                                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /ARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT
        238
                       657
                                                    605
                                                                                   547
                                                                                                                 487
                                     178
                                                                   119
                                                                                                 8
                                                                                                                               10
        VDFVRTYDTVEFLSADTKTT---
                       NV-GAGIATLEGAVIKATTTKLTN-----
                                                    LTDNASAVTFTNPVVVTGAI---
                                                                    N
                                                                                  V--VTGAIDNTGNANNGIVTFTGDSTVTGNIGNTNALATISVGAGKATLGGAIIKATTTK\\
                                                                                               VGSIQASMEGSVELETISLSMTNDSK~--EFVDPYIVVTLKAG-----DNLKIKQNTNE 118
                                                                                                                 NNGIVTFTGDSTVTGNIGNTNALATISVGAGKATLGGAIIKATTTKLTDNASAVTFTNPV
                                                                                                                              NSALNAWVAVSELTRN-HTKRASATVKT-AVLATLLFATVQANATDEDEEEEELESVQRSV
                                     HLNGIGSTLTDMLLNTGATTNYTNDNYTDDEKKRAASYKDVLNAGWNIKGYKPGTTASDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           U83453; AAC35189.1;
                                                                                                                                              162;
                                                                   -NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTV
                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Repeat;
                                                                                                                                                                                                  1009
1013
11182
1314
1314
1451
1624
1628
1872
1872
1878
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1424
60
76
86
126
                                                                                                                                                                                                                                                                                                                                                                                                                                                  1245
                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    rOmpA_rOmpB; 1.
t; Signal; Cell wall; S-layer; Glycoprotein;
                                                                                                                                                                                    ΑA;
                                                                                                                                                                                                                                                                                                                                                                                                                            1308
1877
                                                                                                                                                                                           898
908
985
1009
1013
1114
11314
1451
11624
11628
11679
11879
11879
11970
                                                                                                                                                                                                                                                                                                                                                                                                                                                 1245
                                                                                                                                                                                                                                                                                                                                         640
669
793
                                                                                                                                                                                                                                                                                                                                                                       388
                                                                                                                                                                                                                                                                                                                                                                               10
92
126
137
157
369
                                                                                                                                                      6.4%;
                                                                                                                                                                                    203328
                                                                                                                                                                                                                                                                                                                V -> D (IN REF. 1)
V -> I (IN REF. 1).
N -> D (IN REF. 1).
VN -> IS (IN REF. 1).
LLRVQGGVVKSNTIN -> F.
                                                                                                                                              90;
                                                                                                                                                                                                                                                                                                                                                                             D -> A (IN STRAINS INDIAN T
AND MOROCCAN)
N -> H (IN STRAIN MOROCCAN)
M -> I (IN STRAIN INDIAN TIO
Q -> K (IN REF. 1).
I -> V (IN REF. 1).
V -> I (IN REF. 1).
T -> N (IN REF. 1).
G -> D (IN REF. 1).
IS -> VN (IN REF. 1).
                                                                                                                                                                                    ₩;
                                                                                                                                                                                                 VT -> II
D -> A (I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MISSING
                                                                                                                                                   -TVNV--
                                                                                                                                                                                                                                                                                                                                                                REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N -> NN (IN STRAIN INDIAN TICK TYPHUS).
R -> H (IN STRAIN INDIAN TICK TYPHUS).
                                                     DNTGNANNG
                                                                                                                                                                                                                                                                                                                                                                        KATLGGAIIKATTTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        THR-RICH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OUTER MEMBRANE PROTEIN
                                                                                                                                                                                            ċ
                                                                                                                                              Mismatches
                                                                                                                                                                                    PLP -> ITPPLS (IN REF. 1)
R (IN REF. 1).
327FC42D7CB24668 CRC64;
                       ----AASVLTLTNVNAVLTGAIDNTTGVDN
ESKDNG---KKTEVKIGAKTSVIKEKDGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (IN STRAIN MOROCCAN)
                                                                                                                                                                                                        IN KE. (IN REF. 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                   IN STRAIN INDIAN TICK TYPHUS).
                                                                                                                                                                                                                          REET .
                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN MOROCCAN)
STRAIN INDIAN TI
                                                                                                                                                             DB 1;
                                                     IVTFTGNSTVTGNIGNTNALATV
                                                                                                                                              282;
                                                                                                                                                                                                                                                                                                                                   1).
1).
F. 1)
                                                                                                                                                                                                                                                                                                                                                                        'n
                                                                                                                                                                                                                                                                                                                                                                                                                             INDIAN TICK TYPHUS)
                                                                                                                                                             Length 2021;
                                                                                                                                                                                                                                                                                                                            KATLGGAIIKATTTK
                                                                                                                                                                                                                                                                                                                                                                        LLQVQGGVVKANTIN (IN
                                                                                                                                               Indels 216;
                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                            (IN
                                                                     177
                                                                                    604
                                                                                                                  546
                                                                                                                                 67
                        705
                                      237
                                                     656
                                                                                                                                               36;
```

Ş 밁

```
RESULT 12
BIGA_SALTY
TD BIGA_S
AC P25927
DT 01-MAR
C STALIM
RA SEQUEN
RC STRALN
RA MACTEL
RA COURTE
RA WATER
RA W
                                                                                                                                                                                                                                                                        STRAIN=LT2 / SGSC1412 / ATCC 700720;

MEDLINE=21524948; pubMed=11577609;

McClelland M., Sanderson K.E., Spieth J., Clifton S.W.,

Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou

Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., M

Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., M

Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nha

Waterston R., Wilson R.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Stojiljkovic I., Valenti
"Salmonella typhimurium
Submitted (MAR-1999) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BIGA_SALTY STANDARD; PRT; 19
P25927; P25928; Q9XCQ3;
01-MAY-1992 (Rel. 22, Created)
01-MAR-2002 (Rel. 41, Last sequence up
01-MAR-2002 (Rel. 41, Last annotation
PUTALTY SULFACE EXPOSED VIRULENCE PRO-
BIGA OR STM3478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1171
                         MEDLINE-91100301; PubMed-1987123; Wu J.Y., Siegel L.M., Kredich N.M.; "High-level expression of Escherich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Salmonella typhimurium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1058
                                                                                                       STRAIN-LT2;
                                                                                                                                         SEQUENCE
                                                                                                                                                                   Nature 413:852-856(2001).
[3]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=14028;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=602;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Salmonella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria;
                                                                                                                                                                                                                            "Complete genome sequence IT2.":
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  940
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            826
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GNNAILNVNTKLLTAYHLTIGTVAEINIGAGNLFAIDASAGDVTILNAQDIHFRALDSAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GAIIKATTTKLTDNASAVTFTNPVVVTGAID-----NTG-NANNGIVTFTGDSTVTGNIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VLSNLTGVGVNNILLAADLVAPGVDEGTVVFDGGVNGLNIGSNVA---GAARN----IGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NTNAL - - ATVNVGAGVTLQAGGSLDANNIDFGARSTLEFNGPLDGGGNAIPYYFKGAIAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PSKGKMDETVNINAGNNIEI--TRNGKNIDIATSMTPQFSSVSLGAGADAP----TLSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNASAVTFTNPVVVTGAIDNTGNANNGIVTFTGDSTVTGNIGNTNALATISVGAGKATLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VVTGAIDNTGNANNGIATFTGDSTVTGNIGNTNALATVNVGAGLLRVQGGVVKSNTINLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VGVLNLNGALSQVTGNIGNTNALATISVGAGKATLGGAVIKATTTKLTDNASAVTFTNPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NGNLNIPAGNIKFAHADAQLILQNSSGNDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VGGNKFNTLLIYNAVTITDDVNLEGIQNVLINNNADFTSSTAFNAGTIQINDATYTIDAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -GYSSISAGG-
expression of
for a cloned o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KGKGENGSSTDEGEGLVTAK - - - - EVIDAVNKA - - - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           , Valentine P., himurium rhs hom 1999) to the EMB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----NWIIKGTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RAGIAQAIATAGLVQAYLPGK---
                                                                                                                                      N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -GQTGQADK-FETVTSGTKVTFASGN-GTTATVS------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VAPGVKEGDV----
f Escherichia
cysG plasmid
                                                                                                                                                                                                                                                   of Salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        homolog.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        , Heffron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ion update)
protein bigA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1953
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       579
coli NADPH-sulfite re
to overcome limiting
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FI
:
                                                                                                                                                                                                                                                   enterica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----TNVAQLKGVAQNLNNRIDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DANK - PVRITN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SMMAIGGGT-YLGEAGYAI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      precursor
                                                                                                                                                                                                                                                 serovar Typhimurium
                                                                                                                                                                                                                                                                                                    T., Nhan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -GWRMKTTTAN--
                                                                                                                                                                                                                                                                                                                                 Mulvaney
                                                                                                                                                                                                                                                                                                                                                        Latreille P
                         reductase:
                                                                                                                                                                                                                                                                                                                                 [F]
                                                                                                                                                                                                                                                                                                                                                           n D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            939
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    765
```

DЬ QΥ Вþ Qy 밁 Qy B δÕ 밁 δð 밁 γ 밁

밁 Ş

```
STITE TO THE TENT OF THE TENT 
                              망
                                                             Q
                                                                                                                               Qy
                                                                                                                                                                  Ъ
                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                      Вþ
                                                                                               В
                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
Matches 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; AF133696; AAD39458.1;
EMBL; AE008859; AAL22340.1;
EMBL; M64606; AAA27042.1; A
EMBL; M64606; AAA27043.1; A
PIR; C39200; C39200.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         REPEAT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             use by non-profit institutions as long modified and this statement is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    J. Bacteriol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cofactor.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       StyGene;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PIR; C39200; C39200.
PIR; D39200; D39200.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /irulence;
277
                               506
                                                                 223
                                                                                                 458
                                                                                                                                  177
                                                                                                                                                                    398
                                                                                                                                                                                                   153
                                                                                                                                                                                                                                     341
                                                                                                                                                                                                                                                                      102
                                                                                                                                                                                                                                                                                                      288
                                                                                                                                                                                                                                                                                                                                      50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ween the Swiss Institute of Bioinf
European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in positions 414 and 732.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SWISS-PROT entry is copyright. It is produced een the Swiss Institute of Bioinformatics and European Bioinformatics Institute. There are n
                                                                                                                                                                                                                                       I---
                                                                                                                                                                                                                                                                                                                                    NATDEDEEEELESVQR------SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIV 101
KTSVIKEKDGK-----
                               -----STTVS-----
                                                               WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDN-----
                                                                                                 SDISGAGSTGTVIDGNNARVNNDGDMTITDGGTGGHITGDNVVID
                                                                                                                                VHLNGIGSTLT ---
                                                                                                                                                                    ISGDGTTNTISGHSTVDNATGALISGNGTTTNFAGDIAVSGGGTAIIIDGDNATIKNTGT
                                                                                                                                                                                                     V-----NIISD-----
                                                                                                                                                                                                                                                                   VTLKAGDNLKIKONTNENTNASSFTYSLKKDLTGLI-----NVET----EKLSFGANGKK
                                                                                                                                                                                                                                                                                                      NYSEQDNQWQLTTADGKTLNVTGWDVTDANAAVIEGTQE---NGLYWKYDSR----GYLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AF133696; AAD39458.1;
AE008859; AAL22340.1;
M64606; AAA27042.1; A
                                                                                                                                                                                                                                                                                                                                                                         161;
                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                   -ADDNTTVISGDDQAHNSDRGMDISGQDRTGVIISGDRTVNTLTGDSSVTDGATGMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SG10437; bigA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Repeat;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          189
200
211
222
233
244
207
514
1698
1795
                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                145
156
167
178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   101
101
104
114
123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    173:325-333(1991)
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ΑA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1953
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Signal;
27
                                                                                                                                                                                                                                                                                                                                                                                         6.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            200150
-LVTGKG---
                                                                                                                                                                                                   TKGL-----NFAKETAGTNGDT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALT_FRAME.
ALT_FRAME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         15 (INCOMPLETE).

D -> DRCGDDVTPPDD (IN REF. 1).

A -> R (IN REF. 3).

D -> N (IN REF. 1).

QYLE -> ITLQ (IN REF. 1).

SA -> T (IN REF. 1).

50 MW; 611B3F1C954D91AE CRC64;
                                                                                                                                                                                                                                                                                                                                                                        87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Complete proteome POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                         Score 188;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10.
11.
12.
13.
                                                                                                                                  DMLLNTGAT - TNVTNDNVTDDEKKRAASVKDVLNAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15 X 11 AA TANDEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PROTEIN BIGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PUTATIVE SURFACE-EXPOSED VIRULENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (INCOMPLETE).
(INCOMPLETE).
                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                 -GAD - - ATALY IEG - DNALV I NEGNOT - I SGGA
-KGENGSSTDEGEGLVT - - AKEVI - - DAVNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     from that shown
                                                                                                                                                                                                                                                                                                                                                                                                       BB
                                                                                                                                                                                                                                                                                                                                                                                         .074;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ere are no rest
as its content
                                                                                                                                                                                                                                                                                                                                                                                                       <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                        222;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                         Length 1953;
                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  through a c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     due
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 restrictions
                                                                 GKKTEVKIGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ç
                                                                                                                                                                                                                                                                                                                                                                         212;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      is for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     frameshifts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      collaboration
L outstation -
                                                                                                  -NAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   in
                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 n no way
                                                                                                                                                                                                                                                                     152
319
                                                                                                                                                                    457
                                                                                                                                                                                                                                       397
                                 538
                                                                 276
                                                                                                  505
                                                                                                                                                                                                                                                                                                        340
                                                                                                                                  222
                                                                                                                                                                                                     176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  on
                                                                                                                                                                                                                                                                                                                                                                         42;
```

```
RESULT 13
120K_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-APR-1990
01-FEB-1996
01-MAR-2002
                                                                                                                                                                                                                                                  entities
or send a
                                                                                        Antigen;
CARBOHYD
                                                                                                                               Pfam;
                                                                                                                                                                                                   EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                This
                                                                                                                                                                                                                                                                                                                                                                                                                                  RICKETISIAL UTULLENCE FACTOR AND/OR IMMUNOGEN DURING INFI
-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERI
-!- STAYER WITH HEXAGONAL SYMMETRY.
-!- MISCELLANEOUGS: ITS C-TERMINUS POTENTIALLY MAY BEAR THE EI
CONFERRING ANTIGENICITY TO THE PROTEIN.
-!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P120
                                                                                                                                                                                                                                                                                                use by non-profit institutions as long a modified and this statement is not removed.
                                       CARBOHYD
                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                          between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Cloning, expression and sequence analysis of the gene encoding 120 kD surface-exposed protein of Rickettsia rickettsii."; Mol. Microbiol. 3:1579-1586(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gilmore R.D. Jr.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=90136087; PubMed=2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN-R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Rickettsia rickettsii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120 kDa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P14914;
                                                                                                                                                          InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20K_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            878 ILVYATSSNSSEDRAAITRASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   766
                                                                                                                                                                                                                                                                                                                                          s SWISS-PROT entry is copyright. It is produced through a ween the Swiss Institute of Bioinformatics and the EMBI European Bioinformatics Institute. There are no restrict the contract of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FUNCTION: MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION
                                                                                                                                                ; x16353; CAA34402.1; -. 807575; S07575. rOmpA_rOmpB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WIIKGTASGNSRGHFGASASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NAGNNIEITRNGK-NI----DIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV-ISGNVSPS-----KGKMDETVNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --ATAGLYQAYLP-----GKSMMAIGGGTYLGEAG-----YAI----GYSSISAGGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PLDGTS-----ADITGIS-VSGNSTVTLNGHSTIDTNTVVGGHVVLARVNNGGSLILG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DINV---VSVQDSEGVFSSATGVSVSGDSNAVDITGNVNISADYGQDDLAAGAPPLTGVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AGWRMKTTTANGQTGQADKFETVTSGTKVTF-----ASGNGTTATVSKDDQGNITVKY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DDSVVDVNVSYIPTGYYTYNALLMADGEGTSIENKGDITSHGVYSVIRADNGSEVSNSGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PVRITNVAPGVKEGDVTNVAQLKG---VAQNLNNRIDN---VNGN---ARAGIAQAI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VGGNGNTVTLNGALNIDDNDLSATGGQYLDVVGLSVTGDDNDVEID--GGINI--THSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A----KNTGNATVRDADSVGFVVAGEKNTFKNKGDIDVSLNGTGALVS-GDMSQVTLDG
                                                                                                         PF02708; rOmpA_rOmpB;
en: Glycoprotein; Cell
                                                                                                                                                                                                                                                  s requires a license agreement (S an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      surface-exposed
                                       Glycoprotein; 0 7 7 7 66 66 86 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (Rel. 14, Created)
(Rel. 33, Last sequence up
(Rel. 41, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Joste N., McDonald G.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein
.; 1.
.l wall; S-layer.
N-LINKED (POTENTIAL).
N-LINKED (POTENTIAL).
N-LINKED (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1300
                                                                                                                                                                                                                                                                   (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                         as its content
                                                                                                                                                                                                                                                                                              Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rickettsiales;
                                                                                                                                                                                                                                                                                                уd
                                                                                                                                                                                                                                                                                                                                            he EMBL outstation restrictions on i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          THE EPITOPES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COVERED
                                                                                                                                                                                                                                                                                                   and
                                                                                                                                                                                                                                                                                                   for
                                                                                                                                                                                                                                                                                                                                                                          collaboration
L outstation -
                                                                                                                                                                                                                                                                                                                           in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ВΥ
                                                                                                                                                                                                                                                                                                in no way commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             598
```

```
밁
밁
               δõ
                                    В
                                                     Š
                                                                       뮹
                                                                                          Q
                                                                                                            Вp
                                                                                                                              δõ
                                                                                                                                                B
                                                                                                                                                                  Q
                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                           QY
                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                  DЪ
                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                   CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                          CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                     CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                            329
500
                   409
                                    441
                                                      365
                                                                         381
                                                                                                             321
                                                                                                                               294
                                                                                                                                                 269
                                                                                                                                                                   240
                                                                                                                                                                                      212
                                                                                                                                                                                                         189
                                                                                                                                                                                                                          169
                                                                                                                                                                                                                                             133
                                                                                                                                                                                                                                                               118
                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                 82
                                                                                                                                                                                                                                                                                                   63
                                                                                                                                                                                                                                                                                                                     22 LTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEELESVQRSVVGSIQASMEGSVEL
AGNHHGAVTDT I AF ENSSLGAVVFLPRG I PFNDAGNTMPLT I KSTVGNKTAKGFDVPSVV
                  VSPSKGKMDETVNI - - -
                                                                        ANVGSFVFNAGGTNIVSGTVGGQQGNKFNTVALENGTTVKFLGNATFNGNTTIAANSTLQ
                                                                                            AN--
                                                                                                             KIIFNPVVNNGTTLAAGTNLGSATNPLAEINFGSKGVNVDTVLNVGEGVNLYATNITTTD
                                                                                                                                 K-----
                                                                                                                                                 --KTLG--QFNIGSSKT----VLSNGNVAINELVIGNDGAVQFAHDTYLITRTTNAAGQG
                                                                                                                                                                    FVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT-----GKG
                                                                                                                                                                                      LQANGGTIKLTSTQNNIVVDFDLAIATDQTGVVDASSLTNAQTLTING-KIGTIGANN--
                                                                                                                                                                                                        MLLNTGA--TTNVTNDNVTDDEKKRAASVKDVLNAG-----WNIKGVKPGTTASDNVD
                                                                                                                                                                                                                          ITGDIG-----NAGGAAALQRITLAND-----AKKTLTLGG---ANIIGAGGGTID
                                                                                                                                                                                                                                           LTGLINVETEKLSFGANG----KKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD
                                                                                                                                                                                                                                                               SGTHAAELRLGNAGSIF---
                                                                                                                                                                                                                                                                                ---ETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT----NASSFTYSLKKD
                                                                                                                                                                                                                                                                                                  LTGNFTGDASNPGNTAGVITF-----DANGTLESASADANVAVTNNITAIEASGAGVVQL
                                   IGGNYTADC-VASADGTGIVEFVNTGPITVTLNKQAAPVNALKQITVSGPGNVVINEIGN
                                                       -QGNITVKYDVNVGDALNVNQLQNSG---WNLDSKA----VAGSSGKVIS--GN
                                                                                                                                                                                                                                                                                                                                        159;
                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                               926
1116
1128
1140
1146
1146
                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                     AΑ;
                                                                                                                                                                                                                                                                                                                                                                                                      1211
                                                                                                                                                                                                                                                                                                                                               6.3%;
                                                                                                                               -GEN-GSSTD------EGEGLVTAKEVIDAVNKAGWRMKTTT
                                                                                                                                                                                                                                                                                                                                                                                     132801
                                                                                          -GQTG--QADKFETVT--SGTKVTF---ASGNGTTATVSKDD--
                                                                                                                                                                                                                                                               -----KLADGTVINGKVNQTALVGGALAAGTITLDGSAT
                                                                                                                                                                                                                                                                                                                                       83;
                                                                                                                                                                                                                                                                                                                                                                                     ¥.
                                                                                                                                                                                                                                                                                                                                                                                              N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                        N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                             N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                      Score 187; DB 1; Length 1300; 
Pred. No. 0.051; 
3; Mismatches 274; Indels 19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                    N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                     E09E52C3F647243D
                  -NAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (POTENTIAL)
(POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                             (POTENTIAL)
(POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                       (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                               (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                    (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (POTENTIAL)
                   ----RNGKNIDIATSM
                                                                                                                                                                                                                                                                                                                                                                                     CRC64;
                                                                                                                                                                                                                                                                                                                                       Indels 196;
                                                                                                                                                                                                                                                                                                                                      Gaps
```

117 81

35;

Š

444

PQFSSVSLGAGAD ----

-APTLSV---

DDEGALNVGSKDAN

443 499 408 328

320 293 268

364 380 211 188

```
RESULT 14
SLAP_CAMFE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                       Š
                                                      В
                                                                              Qy
                                                                                                             В
                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SLAP_CAMFE
P35827;
01-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                        J. Biol. Chem. 265:19372-19372(1990).

1. Biol. Chem. 265:19372-19372(1990).

1. FUNCTION: THE S-LAYER IS A PARACRYSTALLINE MONO-LAYERED ASSEMBLY OF PROTEINS WHICH COAT THE SURFACE OF BACTERIA. THIS PROTEIN IS CRITICAL FOR VIRULENCE.
                                                                                                                                                                                                                                                                                                                          the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Campylobacter fetus.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SAPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S-layer protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-JUN-1994 (Rel.
01-JUN-1994 (Rel.
01-OCT-1994 (Rel.
                                                                                                                                                                                                                                                                     EMBL; J05577; AAA23032.1;
                                                                                                                                                                                                                                                                                                             entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                    This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       structure."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-90354448; PubMed-2387868; Blaser M.J., Gotschlich E.C.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=84-32 / 23D;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Campylobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=91035477; PubMed=2229082;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ERRATUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3laser M.J., Gotschlich E.C.;
Surface array protein of Campylobacter
408
                            165
                                                        355
                                                                                 110
                                                                                                             309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           560
                                                                                                                                          51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Biol.
                                                                                                                                                                                                                                                                                              send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                 SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                        ATDEDEEEELESVQRSVVGSIQASMEGSVELETISLS-MTNDSKEFVDPYIVVTLKAGDN 109
                                                                                                                                                                                                                                          wall; S-layer.
ENCE 933 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TPGTVYGLGTGIGASKFKQVT----FTTDYNNLGNIIATNATINDGVTVTTGGIAGIGFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VLGVDSVIADGQVIGDQNNIVGLGLGSDNGIIVNATTLYAGISTLNNNQGTVTLSGGVPN
                          AKETAGTNGDTTVHLNGIGSTLTDMLLNTGA----TTNVTNDNVTDDEK----
                                                                                                             ATDASKSVNVETT--GTITAFTAAGTGKVDVVAGKISALTADSRTSV------N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GK--ITLGSVNGNGNVRFADGILSNSTS---MIGTTKANNGTVTYLGNAFVG
AVENLTVKHATNVALNGGMDKLATVTLDNAALTAAIDIKSASTLNLINSSVNGPKHLYSS
                                                                                 LKIKQNTNENTNASSFT-YSLK----KDLTGLINVETEKLSFGANGKKVNIISDTKGLNF
                                                     LTATNDTITLTSANAATSVNLKQRQAKDAT----ITSAMQQKYNNRRNRIATITSAT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Chem.
                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           265:14529-14535(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11. 29, Created)
11. 29, Last sequence update)
11. 30, Last annotation update)
(Surface array protein) (SAP).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AND
                                                                                                                                                                                                                                          96757 MW;
                                                                                                                                                                                  6.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      epsilon
                                                                                                                                                                      69;
                                                                                                                                                                                Score 184; DB 1; Pred. No. 0.048;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                          F88C729B4BA5B1E9 CRC64;
                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      933
                                                                                                                                                                                                                                                                                                                                     There are no restrictions on ong as its content is in no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       fetus. Cloning and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                                                    231;
                                                                                                                                                                                                                                                                                                                          Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Campylobacter
                                                                                                                                                                                               Length 933;
                                                                                                                                                                   Indels 150;
                                                                                                                                                                                                                                                                                                                             γď
                                                                                                                                                                                                                                                                                                                             and
                                                                                                                                                                                                                                                                                                                                                                       EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      589
                                                                                                                                                                                                                                                                                                                                                                       a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     group;
                                                                                                                                                                                                                                                                                                                                                                                                                              ВУ
                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          619
                                                                                                            354
                          209
                                                     407
                                                                                                                                                                   23;
```

```
Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                             This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                            01-APR-1990 (Rel. 14, Created)
01-APR-1990 (Rel. 14, Last sequence update)
01-NV-1990 (Rel. 16, Last annotation update)
                                           EMBL; M22618; AAA50323.1; -. PIR; A28182; A28182. Hemolysis; Toxin; Outer memb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P15320;
                            SIGNAL
                                                                                                                                                                                                                                                                         -!- FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM
                                                                                                                                                                                                                                                                                                                                                marcescens
                                                                                                                                                                                                                                                                                                                                                             "Molecular characterization of the
                                                                                                                                                                                                                                                                                                                                                                         Poole K., Schiebel E., Braun V.;
                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=88257037; PubMed=3290200;
                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=SN8
                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Serratia marcescens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hemolysin precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HLYA_SERMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   755 TAGTDYSKVSMIDASALKAGLTFDASAITLGANATIKGGSGADS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           210
                                                                                                                                                                                                                SUBCELLULAR LOCATION: Outer membrane. SIMILARITY: TO P.MIRABILIS HEMOLYSIN (HPMA).
                                                                                                                                                                                                                                            ERYTHROCYTES BY INTERACTION WITH REQUIRES SHLB FUNCTION.
                                                                                                                                                                                                                                                                                         DEFINED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----KRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LV-----IDTGIETLNITSLVKATSPETTANTVNAKLTDVTSIIIDGMQITLGHAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NFTAADAGSVKLITVKLN---DVTALMIVVKIVLDAAAKD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SANFTMIKNIENVAISDAVATADLSSSAFKNSVIITTKEAADTTLTINKDQVI-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ALNVNQLQNSGWNLDSKAVAG---SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGK 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NALQSVSFGKTGQGGKFSVKTGTGDDKIEFV---GTTLTEGSVIDAPGNDTIAMKSAALT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RMKTTTANGQTGQADKF--ETVTSGTKVTFASGNGTTATVSK--DDQGNITVKYDVNVGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATDNSLEFDSATAKTTSVTASGSGKTLVIKGA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KRRYCKFKRAAA------KVKLNTTA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Proteobacteria;
                                         Toxin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                           Outer membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                     AND SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EAGYAIGYSSISAGGNWIIKGTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                      S,
                                           Signal
                                                                                                                                                                                                                                                                                                                                                            hemolysin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1608
                                                                                                                                                                                                                                                           THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ä
                                                                                                                                                                                                                                                           ERYTHROCYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -EVETLVN-----IDTTAF
                                                                                                                                                                                                                                                                                                                                                             determinant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----ATDQTVTLKAN 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -TNIALGTAAADKA
                                                                                                                                                                                                                                                             MEMBRANE.
                                                                                                                                                                                                                                                                                                                                                             of
                                                                                                                                                                           a collaboration
                                                                                                                                                                                                                                                                                                      CLEARLY
                                                                                                                                                                                                                                                                                                                                                             Serratia
                                                                                                                                                                                                                                                                                                                    BLOOD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  703
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    322
```

CHAIN SEQUENCE

31 1608

ΑĄ, 1608

165078 MW;

HEMOLYSIN. W; D669B476FE7DAD51 CRC64;

```
뫄
                                  Š
                                                                             뭥
                                                                                                              Qy
                                                                                                                                                             B
                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                            Ş,
                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Бр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 6.1%; Score 183; DB 1; Length 1608; Best Local Similarity 22.0%; Pred. No. 0.1; Matches 163; Conservative 88; Mismatches 244; Indels 246; Gaps
1048 KDAIYQGTALNGGRGKTAVNA 1068
                                567 -NWIIKGTASGNSRGHFGASA 586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          322 WRM------KITI-----------TANGQTGQADKFETVTSGTKVTFAS 352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                662 VASGGELSVESKTGNINVK------AAERQQNIDEQKTALTVNGYAKEAGDKQYRAG 712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                608 TVDKIDARTGTAFNI-----TSSSHKADNSYQSSTASELKSDTNLTLVSHKDADVIGSQ 661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             215
                                                                                                                                                                                              484 N---VAPGVKEGDV------TNVAQLKGVAQNLN------NRIDNVNGNA 518
                                                                                                                                                                                                                                                                                         431
                                                                                                                                                                                                                                                                                                                                  832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                553 NRREISHASEL--TSGG-TLRLNGQQGVTITGSKARGQKGGEVTATHGGLRID--NALST 607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    509 QRDLTIDADNQIQVGVQKTANAKA-------VRDDKTSWGGIGGGDNKNN--S 552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           396
                                                                                996 R-----GSAG-VRVYTTTGSDLTVDAKGEGGTQRSNSSASQAVTGSIDAANGINVNVK 1047
                                                                                                                                                                                                                                                881 ---GANVDYSAVTRPVERAVGKAAKLDA-TGVINDIGGIGAPNVGLDIGAQGGSSEKRSS 936
                                                                                                                                                                                                                                                                                                                                                                       371 KYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI 430
                                                                                                                                                                                                                                                                                                                                                                                                                    773
                                                                                                                                                                                                                                                                                                                                                                                                                                                         353 GNGTTA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                713 LRIEHTRDSEKTTRTENSASSLSGGSVKLKAEKDVTFSGSKLVADKGDASVSGNKVSFLA 772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      456 RGYQRNHTSSLRTGRWSNSDESESLKASELRSEGE-----LTLKAGRNVSTQGAKVHA 508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61 ESVQRSVVGSIQAS-MEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNL------ 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24 RNHTKRASATVKTA----VLAT-----LEATVQAN------ATD------EDEEEEEL 60
                                                                                                                                                             SSQAVVSSVQAGSIDINAKGEVRDQGTQYQASKG-AVNLTADSHRSEAAANRQDEQSRDT 995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              T----EVKIGAKTSVIKEKDGKLYTGKGKGENGSSTDEGEGLVT----AKEVIDAVNKAG 321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DTKGLNFAKETAGTNGDTTVHLNG-IGSTLTDMLL--NTGATTNVTNDNVTDDEKKRAAS 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REQUQQAGSTVAASGSAKLISTQEDVKLLGANVSADRALSVKAARDVHLAGLVEKDKSSE 455
                                                                                                                                                                                                                                                                                      TRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEG-----ALNVGSKDANKPVRIT 483
                                                                                                                                                                                                                                                                                                                                ---INARDKLTQQGAQHSVGGAYQENAAGVDHLAAADTASTTTTKTDVGVNI----- 880
                                                                                                                                                                                                                                                                                                                                                                                                                ADDKTASNTEQTKIGGGFYYTGGIDKLGSGVEAGYENNKTQAQSSKAITSGSDVKGNLT- 831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VKDVLNA----GWNIKGVKPGTTASDNVDFVRTYDIVEFLSADTKTTTVNVESKD-NGKK 269
                                                                                                                    RAGIAQAIATAGLVQAYLPGKSMMAIG----GGTYL--GEAGYAIGYSSISAGG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----KIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANG---KKVNIIS 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----TVSKDDQGNITV 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        37;
```

Search completed: July 3, 2002, 08:29:46 Job time: 1157 sec

```
Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Minimum
                                                                                                                                                                 Result
                                                                                                                                                                                                                                                                                                                                                                                                                                    Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Total number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Searched
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        욙
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Title:
                                                                                                                                                          ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein -
   5
6
7
10
11
11
11
11
11
11
11
11
11
11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      on:
                                                                                                                                                                                                      and
                                                                                                                                                                                                           Pred. No. is the number of results predicted by chance to have score greater than or equal to the score of the result being pu
 2699.7
2699.5
2699.5
2696.2
2696.7
26667
26667
26653
26636
26636
26636
26636
26636
26636
26636
26636
26636
26636
26636
                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB
BG
                                                                                                                                                        Score
                                                                                                                                                                                                     is
                                                                                                                                                                                                                                                                                                                                                                                                                                                     seq
                                                                                                                                                                                                     derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                     length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                               length:
                                                                                                                                                                                                                                                                                                                       SPTREMBL_19:*

1: sp_archea:*
2: sp_bacteria
3: sp_fungl:*
4: sp_human:*
5: sp_inverteb
6: sp_mammal:*
7: sp_mhc:*
8: sp_organell.
                                                                                                                                                        Query
Match
                                                                                                                                                                                                                                         10:
11:
12:
13:
14:
15:
16:
 US-09-771-382-2
2987
1 MNKIYRIIWNSALN
                                                                                                                                                                                                                                                                                                                                                                                                                Minimum Match 0%
Maximum Match 100%
Listing first 45 su
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 July 3, 2002, 08:28:37; Search time 168.02 Seconds (without alignments) 609.529 Million cell up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 562222 seqs, 172994929 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MNKIYRIIWNSALNAWVAVS.....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                       sp_unclassified:*
sp_rvirus:*
sp_bacteriap:*
sp_archeap:*
                                                                                                                                                                                                                                                                                                      sp_phage:*
sp_plant:*
                                                                                                                                                                                                                                                                                                                                                                                      sp_archea:*
                                                                                                                                                                                                                                                                                                                                                                               sp_bacteria:*
                                                                                                                                                                                                                                                                                                                         sp_organelle:*
                                                                                                                                                                                                                                                                                                                                            sp_mammal:*
                                                                                                                                                                                                                                                                                                                                                    sp_invertebrate:*
                                                                                                                                                                                                                                                                            sp_vertebrate:*
                                                                                                                                                                                                                                                                                     sp_virus:*
                                                                                                                                                                                                                                                                                             sp_rodent:*
                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                      2000000000
 ₽B
                    16
2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gapext 0.5
                          0930Y2
0910W4
0910PR8
0910PR3
0910PS2
0910PS2
0910PS2
0910PS3
0910PS3
0910PS3
0910PS3
          Q9JPS6
Q9JR18
                                                                                                                                                         IJ
                                                                                                                                                                                                                                                                                                                                                                                                                  summaries
                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                562222
        O93qy2 neisseria m
O9jps9 neisseria m
O9jpr8 neisseria m
O9jpr8 neisseria m
O9jpr3 neisseria m
O9jpt0 neisseria m
O9jpt0 neisseria m
O9jpr0 neisseria m
O9jpr9 neisseria m
O9jpr9 neisseria m
O9jpr9 neisseria m
O9jpr9 neisseria m
O9jpr8 neisseria m
Q9jps7
                                                                                                                                                       Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cell updates/sec
        8 neisseria m
2 neisseria m
0 neisseria m
7 neisseria m
7 neisseria m
7 neisseria m
8 neisseria m
9 neisseria m
9 neisseria m
9 neisseria m
6 neisseria m
 neisseria
                                                                                                                                                                                                            printed,
                                                                                                                             3 3
```

;	5	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
		223.5	N			229.5	•	231	•	245.5	S	•	4	7	373.5	392.5	416.5	1014	4	2361.5	2363.5	٠	•		2527.5	540.		2554.5	
į	7.5	7.5	7.5	7.6	•	•	7.7			8.2	•	•	11.6	•	12.5				38.4			83.0	•					•	
į	4919	1557	1109	1112	989	2276	3930	1536	1265	1953	1004	1291	2712	1190	1107	2059	1299	1098	2353	530	526	589	589	598	599	595	592	591	600
ı	J.	N	2	N	N	N	16	N	N	16	16	16	16	16	N	16	16	N	N	۵	N	N	N	N	N	2	N	N	Ν
	0.1HZ60	Q9RNI2	Q53505	052781	Q9XD84	Q93TY6	Q98E20	Q48031	Q9FDA0	Q98нJ2	Q9PD63	Q92KQ7	Q9F3X5	Q9PC04	Q9F2D8	Q9PD50	Q9F3X6	Q48152	P71401	Q9JPS1	Q9JPS4	01dr60	Q93QY1	Q9JPR7	Q9JPS8	09ЛРНО	Q9AQF0	Q93QY3	Q9JPS5
			•			Q93ty6 staphylococ	J	Q48031 haemophilus	×	Q98hj2 rhizobium l				Q9pc04 xylella fas	Q9f2d8 salmonella	Q9pd50 xylella fas	pasteure	_	P71401 haemophilus		Q9jps4 neisseria m	Q9jpiO neisseria m	Q93qy1 neisseria m	Q9jpr7 neisseria m	Q9jps8 neisseria m	Q9jph0 neisseria m	Q9aqf0 neisseria m	Q93qy3 neisseria m	Q9jps5 neisseria m

## ALIGNMENTS

```
PRESULT PROPERTY OF THE PROPER
                                                             QΥ
                                                                                                                                           망
                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                        ρy
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12
093QY2 PRELIMINATION
01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=H41;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennin Plantification and characterization of a gene encoding membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157609; AAK68870.1; -.
SEQUENCE 592 AA; 61869 MW; F9403A0B4A18EEA7 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis.
Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria
NCBI_TaxID=487;
                                                                         121
121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EQUENCE FROM N.A.
                                                                                                                                               61
                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                      NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN 180
NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                           ESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                          al Similarity
592; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                          100.0%; ilarity 100.0%; Conservative 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 2987; DB 2;
Pred. No. 6.1e-115;
; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jennings M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   novel outer
                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
180
                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
```

```
RESULT
Q9JPS9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
QΥ
                                                     В
                                                                                          Qy
                                                                                                                                             В
                                                                                                                                                                                    γQ
                                                                                                                                                                                                                                                                                                                                                             ACCOMPAGNATION OF THE PROPERTY OF THE PROPERTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                  Query Match
Best Local !
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                        Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelln H., Moxon E.R., Grandi G., Rappuoli R., "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).

EMBL; AR226361, AAR42510.1; -. SEQUENCE 592 AA; 61917 MW; 4A3471514FD3C879 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-860800;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Prote
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JPS9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                     61
                                                                                               61
                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                   ESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENT
                                                                                                                                             MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTFASGNGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (TrEMBLrel.) (TrEMBLrel.) (TrEMBLrel.)
                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                98.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15, Created)
15, Last sequence 16, Last anno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   beta
                                                                                                                                                                                                                                       Score 2942; D
Pred. No. 4.2e
2; Mismatches
                                                                                                                                                                                                                                          2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           592
                                                                                                                                                                                                                                                                  .2e-113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                             DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              update)
                                                                                                                                                                                                                                                                                        2;
                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria
                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ₽.,
                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          s.
                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
         180
                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                          0
```

```
ACD DETERMINATION OF THE PROPERTY OF THE PROPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9JQW4;
Q9JQW4;
Q1-OCT-2000
01-OCT-2000
01-DEC-2001
                              Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti (Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Parkhill J., Achtman M., James K.D., Bentley S.D., Churcher Klee S.R., Morelli G., Basham D., Brown D., Chillingworth T. Davies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Hc Jagels K., Leather S., Moule S., Mungall K., Quail M.A., Rajandream M.A., Rutherford K.M., Simmonds M., Skelton J., Whitehead S., Spratt B.G., Barrell B.G.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PUTATIVE
NMA1200 C
                                                                                                                                                                                                                                                                                                                                                                   "Complete DNA sequence of meningitidis Z2491.";
Nature 404:502-506(2000).
[2]
                                                                                                                                                                                                                                                                                           STRAIN-205900, BZ133, F6124, AND Z2491; MEDLINE-20175756; PubMed-10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-Z2491 / SEROGROUP A / SEROTYPE MEDLINE-20222556; PubMed-10761919;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RITHVAPGYKEGDYTHVAQLKGYAQNLHHRIDHVNGNARAGIAQAIATAGLYQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
AL162755;
AF226357;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OR GNA99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SURFACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (TremBLrel. 15, Created)
(TremBLrel. 15, Last sequence update)
(TremBLrel. 19, Last annotation updat
RFACE FIBRIL PROTEIN (OUTER MEMBRANE P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
CAB84461.1;
AAF42506.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                ы
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   beta
                                                                                                                                                                                                                                                                                                                                                                                                                                              serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           592
                                                                                                                                                                                                                                                                                                                                                                                                                                              A strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4 A ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PROTEIN GNA992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Holroyd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                c.,
                                                                                                                                                                                                                        s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ល
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
```

```
PARTICLE PROPERTY OF THE PROPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DR
DR
DR
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                        Q9JPR8: PRELIMINARY;
Q9JPR8;
01-OCT-2000 (TrEMBLrel. 15, C
01-OCT-2000 (TrEMBLrel. 15, L
01-DEC-2001 (TrEMBLrel. 19, L
OUTER MEMBRANE PROTEIN GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; AF226365; I
EMBL; AF226373; I
EMBL; AF226386; I
Complete proteome
SEQUENCE 592 AI
STRAIN-NGH38;

MEDLINE-20175756; PubMed=10710308;

MEDLINE-20175756; PubMed=10710308;

MIDIAN SCARIATO V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nut

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo F

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.
                                                                                                                                                                      Neisseria meningitidis.
Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                                                                                                                                                                         GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                           539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                         KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--SDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   il Similarity
558; Conser
                                                                                                                                                                                                                                         OR
                                                                                                                                      FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   proteome.
592 AA;
                                                                                                                                                                                                                                           NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                        z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAF42514.
AAF42522.
AAF42535.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    93
93
                                                                                                                                                                                                                                                        . 15, Last sequence update)
. 19, Last annotation updat
GNA992 (NHHA OUTER MEMBRAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . 9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ¥.
                                                                                                                                                                                                   beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2779; D
Pred. No. 1.9e
9; Mismatches
                                                                                                                                                                                                                                                                                                                   Created;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9;
                                                                                                                                                                                                 subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AD22E2F5EEF8F754
                                                                                                                                                                                                                                                                                                                                                           599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .9e-1
                                                                                                                                                                                                                                                                                                                                                         ₿
                                                                                                                                                                                                                                                          on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB
                                                                                                                                                                                                 Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                            PROTEIN)
                                                                                                                                                                                               Neisseria
                                        chi B.,
Nuti S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         592
                        P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                          s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2
```

```
RESULT Q9JP13 Q9JP13 AC Q5 DT 01 DT 01 DT 01 DT 02 DT 02 DT 02 DT 03 DT 04 DT 04 DT 05 DT 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20
                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         νg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  БР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Ma
Best Loc
Matches
                                                                         Q9JPI3
Q9JPI3;
Q9JPI3;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
GNA992.
Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Peak I.R., Srikhanta Y., Dieckelman M
Tidentification and characterization
membrane protein of Neisseria meningi
Submitted (JUN-1999) to the EMBL/GenB
EMBL; AF226383; AAF42532.1;
EMBL; AF157608; AAF68869.1;
SEQUENCE 599 AA; 62844 MW; BBA16E
                                                             OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-H38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                           540
                                                                                                                                                                                                                                                                                              533
                                                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                                                                          473
                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                        413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Match
Local Similarity y...
547; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          _
                                                                                                                                                                                                u
                                                                                                                                                                                                                                                       KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ESVQRS-VVGSIQASMEGSVELET---ISLSMINDSKEFVDPYIVVTLKAGDNLKIKQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EPVVRSALVLQFMIDKEGNGENESTGNIGWSIYYDNHNTLHG-ATVTLKAGDNLKIKQNT
                                                             MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FROM
meningitidis.
Proteobacteria;
                                                         (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence up
(TrEMBLrel. 16, Last annotation
and PROTEIN GNA992.
                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        90.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Dieckelman M., Moxon R
acterization of a gene
seria meningitidis.";
the EMBL/GenBank/DDBJ d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
Pred.
                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BBA16EBF53C1970C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2699.5;
No. 3.46
                                                                                                                                                           594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5; DB 2
3.4e-103;
nes 33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Granoff
                                                                                                                                                         A
                                                                             on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  D.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jennings
coding a n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Venter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          outer
                                                                                                                                                                                                                                                                                                                                                                            532
                                                                                                                                                                                                                                                                                                                                                                                                                   479
                                                                                                                                                                                                                                                                                                                                                                                                                                                        472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                           599
                                                                                                                                                                                                                                                                                                                                     539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              119
```

4,

beta

subdivision;

Neisseriaceae;

Neisseria

. ....

```
δ
                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                              δô
                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                В
                                                                                                                                                                                                    Q
                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                В
                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
A Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
"Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
R EMBL; AF223369; AAF42518.1; -.
R EMBL; AF223369; AAF42518.1; -.
C SEQUENCE 594 AA; 62086 MW; 1B25E03B90D04B46 CRC64;
Q9JPS2;
Q1-OCT-2000 (TrEMBLrel..15, Created)
Q1-OCT-2000 (TrEMBLrel. 15, Last sequence up
Q1-MAR-2001 (TrEMBLrel. 16, Last annotation
QUTER MEMBRANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=NG3/88, AND BZ232; MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=487; [1]
                                                                      Q9JPS2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N
                                                                                                                                  535
                                                                                                                                                                                                                                 415
                                                                                                                                                                                                                                                        413
                                                                                                                                                                                                                                                                                                                               295
                                                                                                                                                                                                                                                                                                                                                     293
                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                             175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Match
Local Similarity 51.2
547; Conservative
                                                                                                                                                                                                                                                                                                       353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                              σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                              GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                                                                                                                                                                                                                                                        TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                           ESVQRSV-VGSIQASMEGSVELETISLSMTNDS-----KEFVDPYIVVTLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL
                                                                                                                                                                                                                                            KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                 GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                              TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EPVQRTAPVLSFHADSEGTGEKE - - - -
                                                                       PRELIMINARY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    90.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; Score 2696; DB 2;
; Pred. No. 4.7e-103;
11; Mismatches 28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 · VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI
                                                                       594
                                                                      B
                                   update)
                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E., Capecchi B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Zuo P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                 414
                                                                                                                                                                                                                                                                                                                               354
                                                                                                                                                                                                                                                                                                                                                                               294
                                                                                                                                                                                                                                                                                                                                                                                                                             234
                                                                                                                                                                                                                                                                                                                                                                                                                                                   232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            174
                                                                                                                                                                                 534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4;
```

```
RESULT
Q9JPTO
ID QS
AC Q9
DT 01
DT 01
                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                         õ
                                                                                                                                 В
                                                                                                                                                    Qγ
                                                                                                                                                                           В
                                                                                                                                                                                                Ş
                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                            뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NA Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
RA Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Ra Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
RA Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
RA Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
RA Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
RA Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole Genome Sequencing.";
Science 287:1816-1820(2000).
REMBL; AF226379; AAR42528.1; -
REMBL; AF226379; AAR42528.1; -
REMBL; AF226579; AAR42528.1; -
REMBL; AF226579; AAR42528.1; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 546; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GNA992.
Neisseria
Bacteria;
Q9JPT0;
Q9JPT0;
01-OCT-2000
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN=NGES1;
MEDLINE=20175756; PubMed=10710308;
Command V., Masignani V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM STRAIN-NGE31;
                                                                                        535
                                                                                                            533
                                                                                                                                  475
                                                                                                                                                                            415
                                                                                                                                                                                                  413
                                                                                                                                                                                                                         355
                                                                                                                                                                                                                                             353
                                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                                        293
                                                                                                                                                                                                                                                                                                             235
                                                                                                                                                                                                                                                                                                                                                        175
                                                                                                                                                                                                                                                                                                                                                                            173
                                                                                                                                                                                                                                                                                                                                                                                                 115
                                                                                                                                                                                                                                                                                                                                                                                                                       113
                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                        7
                                                                                                                                                                                                                                                                                                          GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                 KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                 GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                ESVQRSV-VGSIQASMEGSVELETISLSMTNDS-----KEFVDPYIVVTLKAGDNLKI 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                     GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                   GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                             EPVQRTAPVLSFHADSEGTGEKE-----VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            90.1%;
91.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pred. No. 6.90
1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2692;
Pred. No. 6.
                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              subdivision;
                                  598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .9e-103;
                                  Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Capecchi B.
ra M., Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      н.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          s;
                                                                                                                                                                                                    472
                                                                                                                                                                                                                                               412
                                                                                                                                                                                                                                                                                                                                                                              232
                                                                                                                                                                                                                                                                                                                                                                                                    174
                                                                                                                                                                                                                                                                                                                                                                                                                        172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           59
                                                                                          594
                                                                                                                                    534
                                                                                                                                                         532
                                                                                                                                                                               474
                                                                                                                                                                                                                                                                     354
                                                                                                                                                                                                                                                                                         352
                                                                                                                                                                                                                                                                                                              294
                                                                                                                                                                                                                                                                                                                                    292
                                                                                                                                                                                                                                                                                                                                                         234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
```

(TrEMBLrel.

Created) Last seq

sequence

update)

Last

annotation

SQRETTIAN

```
MEDLINE-20175756; PubMed=10710308;

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.

A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).

PR EMBL; AF226359; AAF42508.1;

EMBL; AF226359; AAF42508.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 543; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-MAR-2001 (TI
OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria
593
                        587
                                                       533
                                                                                  527
                                                                                                               473
                                                                                                                                          467
                                                                                                                                                                      413
                                                                                                                                                                                                 407
                                                                                                                                                                                                                              353
                                                                                                                                                                                                                                                         347
                                                                                                                                                                                                                                                                                       293
                                                                                                                                                                                                                                                                                                                  287
                                                                                                                                                                                                                                                                                                                                               233
                                                                                                                                                                                                                                                                                                                                                                          227
                                                                                                                                                                                                                                                                                                                                                                                                        173
                                                                                                                                                                                                                                                                                                                                                                                                                                 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                              113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .
                                                                                                         KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                   KLYTGKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                                           GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                  ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA
                                                                                                                                                                                                                                                                                                                                               GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                                                                                                                    ETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KIKQNTNENTNA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                        SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                     ETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                              KIKONTNENTNESSTTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAK
SVGYQW
                                                      ATAGLAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWYIKGTASGNSRGHFGTSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Proteobacteria;
                         592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (Tremblrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     89
98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        . 16, La
GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    . 39
68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 2667; un
Pred. No. 7.3e
11; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .3e-102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Η.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          · .
                                                      592
                                                                                 586
                                                                                                            532
                                                                                                                                        526
                                                                                                                                                                     472
                                                                                                                                                                                                466
                                                                                                                                                                                                                             412
                                                                                                                                                                                                                                                         406
                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                               346
                                                                                                                                                                                                                                                                                                                                               292
                                                                                                                                                                                                                                                                                                                                                                        286
                                                                                                                                                                                                                                                                                                                                                                                                                                 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                              172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6,
```

γ

₽ Š

Ş В

В

Š

밁

망 Qy 밁 δÃ В δõ 밁 γo 밁 γQ 밁 ρ B QΥ

```
RESULA OLD PROPERTIES OF THE P
  В
                                 Qy
                                                                                    B
                                                                                                                       Qy
                                                                                                                                                                      ф
                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q9JPS0;
01-OCT-2000
01-OCT-2000
01-DEC-2001
OUTER MEMBRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNA992 OR
Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Identification and characterization of a gene encoding membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases EMBL; AF226381; AAF42530.1; -. EMBL; AF157607; AAK68868.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' Comanducci M., Jennings G.T., Baldi L., Bartolini E., Cape Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettel Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Ver Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=NGH15;
MEDLINE=20175756; PubMed=10710308;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OSAL6D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN-H15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria;
                                            407
                                                                                      353
                                                                                                                                                                           293
                                                                                                                                                                                                                287
                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                     227
                                                                                                                                                                                                                                                                                                                                               173
                                                                                                                                                                                                                                                                                                                                                                                       167
                                                                                                                                                                                                                                                                                                                                                                                                                                 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             æ
GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                    KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                      KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                               GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                                                                     ETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                                             KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EPVQRTAVVLSFRSDKEGTGEKEG-----TEDSNWAV--YFDEKRVLKAGAITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI------VVTLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                             GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                                               ETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      T-2000 (TrEMBLrel.
C-2001 (TrEMBLrel.
MEMBRANE PROTEIN G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AΑ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . 15, Created)
L. 15, Last sequence 19, Last anno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 2667; D
Pred. No. 7.3e
LO; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  E6C7AEF0BB8A63CB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sequence update)
annotation update)
HHA OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2667;
No. 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 2;
.3e-102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Jennings
coding a r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 E., Capecchi
Mora M., Nut
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tettelin H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Zuo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ס
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               c.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   si.
                                                                                                                                406
                                                                                                                                                                                                                                                                                                                                                                                                                                   172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59
                                              466
                                                                                      412
                                                                                                                                                                           352
                                                                                                                                                                                                                346
                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                     286
                                                                                                                                                                                                                                                                                                                                                                                         226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
Q9JPH7
망
                         80
                                                   В
                                                                         δÃ
                                                                                                     В
                                                                                                                          δÃ
                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                        Query Match
Best Local S
Matches 542
                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
"Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennir "Identification and characterization of a gene encoding membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases. EMBL; AF226358; AAF42517.1;
EMBL; AF26358; AAF42517.1;
EMBL; AF157604; AAK68865.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-OCT-2000
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A. STRAIN=BZ198, AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNA992 OR NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
OUTER MEMBRANE PROTEIN GNA992 (NHHA OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q9JРН7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9JPH7;
01-OCT-2000
                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                          STRAIN-BZ198;
                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
   173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               587
                            171
                                                      113
                                                                             111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                467
                                                                                                      60
                                                                                                                              61
                                                                                                                                                       <u>بــ</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                 TNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                    KIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                          ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI-----VVTLKAGDNL 110
                                                   KIKONTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SVGYQW
                                                                                                      EPVQRTAVVLSFRSDKEGTGEKEG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SVGYQW
                                                                                                                                                                                                         al Similarity
542; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (TrEMBLrel. 15, (TrEMBLrel. 15, (TrEMBLrel. 19,
                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                       A
A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     297-0;
                                                                                                                                                                                                                                                                       62361 MW;
                                                                                                                                                                                                                  89.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
                                                                                                                                                                                                       Score 2664; DB 2;
Pred. No. 9.6e-102;
9; Mismatches 33;
                                                                                                                                                                                                                                                                      436BDDED68263C5C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      subdivision; Neisseriaceae;
                                                                                                    -TEDSNWAY--YFDEKRVLKAGAITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A
                                                                                                                                                                                                                              Length 594;
                                                                                                                                                                                                                                                                                                                                             Jennings
coding a r
                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROTEIN)
                                                                                                                                                                                                        18;
                                                                                                                                                                                                                                                                                                                                                          M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Nuti S.,
                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                outer
                                                                            170
                                                                                                                                                       59
                                                   172
                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             586
                                                                                                                                                                                                       5
```

```
Š
                        망
                                          QΥ
                                                                         Д
                                                                                              Qy
                                                                                                                         밁
                                                                                                                                              Qy
                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                      Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q93QY5;
Q93QY5;
01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                  Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennir "Identification and characterization of a gene encoding membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases EMBL; AF157603; AAK68864.1; -.
SEQUENCE 598 AA; 62687 MW; 18CEFFE6410A15DF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                             01-DEC-2001 (TrEMBLrel. 19, 01-DEC-2001 (TrEMBLrel. 19, 01-DEC-2001 (TrEMBLrel. 19, NHHA OUTER MEMBRANE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=487;
[1]
                                                                                                                                                                                                                                                                                                                                                                                                             Bacteria;
                                                                                                                                                                                                                                                                                                                                                           STRAIN-BZ10
                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria
                         173
                                               167
                                                                         113
                                                                                                 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              411
 227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               231
                                                                                                                                                                                                                                   y Match
                                                                                                                         60
                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10
                                                                      KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK 166
                                                                                                                                                                                    MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF 350
                       ETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK 226
                                                                                                                                                                        MNKISRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
 GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                               ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI-----VVTLKAGDNL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GKGKDENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                         EPVQRTAVVLSFRSDKEGTGEKEG----TEDSNWAV--YFDEKRVLKAGAITLKAGDNL 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VGSKDTNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PSKGKMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS 410
                                                                                                                                                                                                                       al Similarity
542; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 592
                                                                                                                                                                                                                                                                                                                                                                       FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                        meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                            Proteobacteria;
                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRELIMINARY;
                                                                                                                                                                                                                                   89.0%;
                                                                                                                                                                                                                                                                                                                                                                                                             beta
                                                                                                                                                                                                                        11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Created)
Last seq
                                                                                                                                                                                                                      Score 2658; I
Pred. No. 1.7e
L1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                             subdivision; Neisseriaceae;
                                                                                                                                                                                                                       ; DB 2;
1.7e-101;
hes 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                             Length 598;
                                                                                                                                                                                                                                                                                                                                  Jennings
coding a n
                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                M. P.
                                                                                                                                                                                                                       22;
                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria
                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                    outer
                                                                                                                                                                         59
                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       472
 286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       292
                                                                                                                                                                                                                        6,
```

```
δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
   밁
                   δÃ
                                             밁
                                                                  Ş
                                                                                           Ъ
                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                    RA Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi E. Ra Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti R. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P. Ratti G., Lundt E., Knapp B., Blair E., Mason T., Tettelin H., Vahood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C. M. Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";

L Science 287:1816-1820(2000).

R EMBL; AF226382; AAF42531.; -.

R SEQUENCE 598 AA; 62718 MW; 9095F8E31AD7C76D CR764.
                                                                                                                                       Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                         Q9JPR9;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                 STRAIN=NGH36;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                     GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q9JPR9
                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                              Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                OUTER
                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID-487;
   113
                       111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233
                                                                                                                                                  Local
                                              60
                                                                     61
                                                                                           _
                                                                                                                 \vdash
                                                                                                                                                              Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SVGYQW
                                                                                        KIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EPVQRTAVVLSFRSDKEGTGEKEG - -
                                                         ESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATAGLAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KLYTGKGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                                                                                                             T-2000 (TrEMBLrel. 15, Created)
T-2000 (TrEMBLrel. 15, Last sequence update)
R-2001 (TrEMBLrel. 16, Last annotation updat
MEMBRANE PROTEIN GNA992.
                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis
                                                                                                                                                                                                                                                                                                                                                                                            Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    592
                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                 88.8%;
                                                                                                                                                                                                                                                                                                                                                                                            beta
                                                                                                                                     Score 2653; D
Pred. No. 2.7e
9; Mismatches
                                                                                                                                       9;
                                                                                                                                                                                                                                                                                                                                                                                            subdivision;
                                             TEDSNWAV--YFDEKRVLKAGAITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       598
                                                                                                                                                 DB 2;
?.7e-101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                            Neisseriaceae;
                                                                                                                                                           Length
                                                                                                                                      Indels
                                                                     ----VVTLKAGDNL
                                                                                                                                                                                                                                                                                                             Capecchi
                                                                                                                                                             598;
                                                                                                                                      22;
                                                                                                                                                                                                                                                                                                                                                                                            Neisseria.
                                                                                                                                                                                                                                                                                                chi B.,
Nuti S.,
                                                                                                                                                                                                                                                                             Ή.,
                                                                                                                                     Gaps
                      166
                                             112
                                                                  110
                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      406
                                                                                           59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  346
                                                                                                                                      6,
```

```
RESULT QSPUSIA PROPERTY OF STATE OF STA
    Дb
                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                            Query Match
Best Local S
Matches 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9JPS3;
Q1-OCT-2000 (TrEMBLrel. 15, Created)
Q1-OCT-2000 (TrEMBLrel. 15, Last sequence update)
Q1-MAR-2001 (TrEMBLrel. 16, Last annotation updat
                                                                                                                                                                                                                                                                    MEDLINE-20175756; PubMed-10710308;
MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Barchetti E., Kora M., Nuti
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
MOXON E.R., Grandi G., Rappuoli R.,
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis.
Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                                                                                                                                         Meningococus by Whole-Genome : Science 287:1816-1820(2000).
EMBL; AF226378; AAF425271; -.
SEQUENCE 590 AA; 61661 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q9JPS3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12
    _
                                                 \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA 586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLSATVQANATDEEDEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        598
                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                    88.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    beta
                                                                                              21;
                                                                                            Score 2645; D
Pred. No. 5.7e
21; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                              8AA476AC300D80C8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         590
                                                                                            DB 2;
5.7e-101;
nes 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                              CRC64;
                                                                                                                                       Length
                                                                                              Indels
                                                                                              12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                         Nuti:
                                                                                                                                                                                                                                                                                                                                                                                                                                   œ
                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                              s.
    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       406
                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           292
                                                                                              4.
```

Š

61

ESVQRSV-VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV--

--VTLKAGDNLKIKQN 115

```
RESULT
1D 293QY4
1D 203
AC 203
                 Q
                                                                       밁
                                                                                                              δÃ
                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                         Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings "Identification and characterization of a gene encoding a n membrane protein of Neisseria meningitidis."; Submitted (JUN-199) to the EMBL/GenBank/DDBJ databases. EMBL; AF157605; AAK68866.1; ... SEQUENCE 594 AA; 62297 MW; 9DDD48804B3A8EA2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-DEC-2001 (Tremblrel. 19, 01-DEC-2001 (Tremblrel. 19, 01-DEC-2001 (Tremblrel. 19, 01-DEC-2001 (Tremblrel. 19, NHHA OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q93QY4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-EG327;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis
                        113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            296
                                                                       60
                                                                                                                 61
                                                                                                                                                                                                                                                             Local Similarity
nes 536; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                              ш
                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ANKPYRITNVAPGVKEGDYTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TVHLNG IGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNI KGVKPGTTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DPVQRTVAVLIVNSDKEGTGEKEKVE-ENSDWAVYFNEKGVLTAGTITLKAGDNLKIKQ-
                        KONTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN
                                                                                          ESVQR-SVVGSIQASMEGSVELETISLSMTNDS------KEFVDPYIVVTLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EPVQRTAVVLSFRSDKEGTGEKE-----VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI
                                                                                                                                                               MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKG
FROM N.A.
                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                   88.2%;
89.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     beta
                                                                                                                                                                                                                                                             15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                Score
Pred.
subdivision;
                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                   No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                          ; DB 2;
1.3e-100;
hes 35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A
Neisseriaceae;
                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           novel
                                                                                                                                                                                                                                                             14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            415
                                                                                                                                                               59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                173
                                                                                                                                                                                                                                                          4.
```

```
ADD DE CONTROL OF THE CONTROL OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
Q9JPS6
  밁
                                                 QΥ
                                                                                                       B
                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 535; Conserv
                                                                                                                                                                                                                                                                                                                                                       Ratti G., Santini L., Savino S., Scarselli M., S
Broeker M., Hundt E., Knapp B., Blair E., Mason
Hood D.W., Jeffries A.C., Saunders N.J., Granoff
Moxon E.R., Grandi G., Rappuoli R.,
"Identification of Vaccine Candidates Against Se
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226371; AAF42520.1;
SEQUENCE 600 AA; 62762 MW; 36256963E0598CD1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-E26; PubMed=10710308; MEDLINE=20175756; PubMed=10710308; Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Pizza M., Sennings G.T., Baldi L., Bartolini E., Capecchi B., Comanducci M., Jennings G.T., Baldi L., Marchetti E., Mora M., Nuti S Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Teuro P., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Ratti G., Santini L., Knapp B., Blair E., Mason T., Tettelin H., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Broeker M., Farina A.C., Saunders N.J., Granoff D.M., Venter C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q9JPS6;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Proteobacteria; NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               09JPS6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     115
  61
                                                      55
                                                                                                          -
                                                                                                       MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANA-----TDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
EEEEYLEPVVRTAPVLSFYSDAEDTGEKEV--TENTNWGIYFDKNGVIKAGTITLKAGDN
                                  DEEEELESVQRSV-VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV----VTLKAGDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \tt DKGENDSSTDKGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TASDNVDFVRTYDTVEFLSADTKTTTVNVESKONGKRTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KONTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FROM
                                                                                                                                                                                                                  87.8%;
nilarity 88.7%;
Conservative 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (TrembLrel. 15, Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROTEIN GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       beta
                                                                                                                                                                                                                     ; Score 2623; DB 2;
; Pred. No. 4.6e-100;
14; Mismatches 40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subdivision;
                                                                                                                                                                                                                                                                                                                                                            36256963E0598CD1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Serogroup
                                                                                                                                                                                                                                                                                                                                                            CRC64;
                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                        14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria
                                                                                                                                                                                                                     Gaps
                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      292
                                                                                                                                                                                                                        Ģ
```

Ş

```
29 JERN 29 JER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.

(C STRAIN=MC58 / SEROGROUP B, BZ169, BZ83, AND H44/76;

(C STRAIN=MC58 / SEROGROUP B, BZ169, BZ83, AND H44/76;

(C STRAIN=20175756; PubMed=10710308;

(X MEDLINE=20175756; PubMed=10710308;

(X MEDLINE=2017576; PubMed=10710308;

(X MEDLINE=2017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROTEIN).
GNA992 OR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q9JR18 PRELIMINARY; PRT; 591 AA.
Q9JR18;
01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
00TER MEMBRANE PROTEIN GNA992 (ADHESIN) (NHHA OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis, and
Neisseria meningitidis (serogroup
Bacteria; Proteobacteria; beta sut
NCBI_TaxID-487, 491;
SEQUENCE FROM N.A.

STRAIN=MCS8 / SEROGROUP B;

MEDLINE=20175755; PubMed=10710307;

Tettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., Nels
Eisen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J.,

Nelson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K.,

Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Doughert
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MOA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PGTTASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           oup B).
subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEMBRANE
                                                                                                      Nelson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Chi B.,
Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                     P.,
                                                                                                      7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  229
```

```
δõ
                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                           δÃ
                                                                                                                                                      밁
                                                                                                                                                                                                          멍
                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
Matches 52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SPECIES=N. meningitidis; STRAIN=PMC21;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R.,
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R.,
Pidentification and characterization of a gene end
membrane protein of Neisseria meningitidis.";
Submitted (JUN-199) to the EMBL/GenBank/DDBJ data
EMBL; AF226375; AAF44524.1; -.
EMBL; AF226370; AAF42516.1; -.
EMBL; AF226370; AAF42516.1; -.
EMBL; AF226370; AAF42519.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Complete SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Cotton M.D., Utterback T.R., Khouri H., Qin H., Vamathevan J., Gill J., Scarlato V., Masignani V., Pizza M., Grandi G., Sun L. Smith H.O., Fraser C.M., Moxon E.R., Rappuoli R., Venter J.C.; "Complete genome sequence of Neisseria meningitidis serogroup MC58."; Science 287:1809-1815(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                   473
                                                                             474
                                                                                                       414
                                                                                                                               414
                                                                                                                                                         354
                                                                                                                                                                                 354
                                                                                                                                                                                                            294
                                                                                                                                                                                                                                     294
                                                                                                                                                                                                                                                               234
                                                                                                                                                                                                                                                                                        234
                                                                                                                                                                                                                                                                                                                  174
                                                                                                                                                                                                                                                                                                                                          174
                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                                                                                               114
                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                    ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKG
                                                                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEE-
-LESVQRSV-VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV----VTLKAGDNLKIK
                                                   KKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ
                                                                 KDANKPYRITUVAPGYKEGDYTUVAQLKGYAQNLUNRIDUVUGUARAGIAQAIATAGLYQ
                                                                                                                                                                                                                                                                                                                                                                                                                     YLDPVQRTVAVLIVNSDKEGTGEKEKVE-ENSDWAVYFNEKGVLTAREITLKAGDNLKIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -
-
:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              524;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      T., Ciecko A., Parksey M.D., Utterback T.R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            62112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      86.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ¥.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 2573.5;
Pred. No. 4.7e
23; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      D.S., E
Khouri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7C22F3CAE7F73EC6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Blair
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .7e-98;
nes 37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     F) .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cittone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      R., Jennings
e encoding a r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ξ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      s M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   lark
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .
В.,
  591
                                                                                                       472
                                                                                                                                                                                   413
                                                                                                                                                                                                                                                                                                                                                                      173
                                                                                                                                                                                                                                                                                                                                                                                              173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    59
                                                                                                                                                          413
                                                                                                                                                                                                            353
                                                                                                                                                                                                                                      353
                                                                                                                                                                                                                                                               293
                                                                                                                                                                                                                                                                                          293
                                                                                                                                                                                                                                                                                                                   233
                                                                                                                                                                                                                                                                                                                                            233
```

6,

THIS PAGE BLANK (USPTO)

```
8
                                                  Run on:
                                                                                        protein -
                                                                                      protein search, using sw model
July 3, 2002, 08:09:03; Search time 168.6 Seconds (without alignments) 388.034 Million cell updates/sec
                                                                                                                                                    GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
```

Scoring table:	Title: Perfect score: Sequence:	
BLOSUM62 Gapop 10.0 , Gapext 0.5	US-09-771-382-3 2994 1 MNKIYRIIWNSALNAWVVVSTASGNSRGHFGTSASVGYQW 589	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Searched: 747574 seqs, 111073796 residues

Total number of hits satisfying chosen parameters: 747574

Maximum Minimum DB Bd seq length: 0 length: 2000000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

		Database :
15: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1994.DAT:* 16: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DAT:* 17: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1995.DAT:* 18: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1997.DAT:* 19: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:* 20: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:* 21: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA2000.DAT:* 22: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA2000.DAT:*	8: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1987.bAT:* 9: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1988.DAT:* 10: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1989.DAT:* 11: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1990.DAT:* 12: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1991.DAT:* 13: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1991.DAT:* 14: /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA1993.DAT:*	A_Geneseq_032802:*  1: /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1980.DAT:* 2: /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1981.DAT:* 3: /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1983.DAT:* 4: /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1983.DAT:* 5: /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1985.DAT:* 5: /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1985.DAT:* 7: /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1985.DAT:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed and is derived by analysis of the total score distribution.

## SUMMARIES

ಸ

Result No.	Score	Query Match Length DB	ength	DB	ID	Description
1	2994	100.0	589	20	AAY23745	A surface protein
2	2994	100.0	589	22	AAU06173	N. meningitidis P2
ω	2694	90.0	599	20	AAY23743	A surface protein
4	2694	90.0	599	22	AAU06176	N. meningitidis H3
<sub>U</sub>	2626.5	87.7	592	22	AAU06180	N. meningitidis Z2
6	2616.5	87.4	598	20	AAY23738	A surface protein
7	2616.5	87.4	598	22	AAU06178	N. meningitidis BZ
8	2610.5	87.2	598	20	AAY23742	A surface protein
9	2610.5	87.2	598	22	AAU06177	N. meningitidis H1
10	2580.5	86.2	592	20	AAY27203	Amino acid sequenc
11	2573.5	86.0	594	20	AAY23739	A surface protein

Neisseria meningitidis surface proteins useful for treating meningitidis infections

z

WPI; 1999-418754/35. N-PSDB; AAX85797.

(ISIS-) ISIS

INNOVATION LTD. Moxon ER,

Jennings MP,

Peak IRA;

## ALIGNMENTS

AAY23745 Neisseria meningitidis A surface protein of Neisseria meningitidis. 08-SEP-1999 (first entry) AAY23745; 12-DEC-1997; 14-DEC-1998; 24-JUN-1999. WO9931132-A1. Surface protein; surface glycoprotein; infection; vaccine; AAY23745 standard; Protein; immunoreactive peptide. μ. 97GB-0026398 98WO-AU01031. 589 A

```
RESULT
AAU06173
ID AAU0
XX AAU0
AC AAU0
XX AAU0
XX Y
AC AAU0
XX Y
XX Y
DT 24-C
XX Y
DE N. m
XX Surf
XX Surf
XX Neis
                                                                                                                                                                                                   В
                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                             뫄
                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ОĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SX CCCCCCXXX
                                                                                                                                                            Дb
                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermestable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, respecially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
  Neisseria meningitidis strain
                     Surface antigen NhhA; meningococcal
                                          N. meningitidis P20 surface antigen NhhA polypeptide sequence
                                                               24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim
                                                                                                                                                            541
                                                                                                                                                                                                     481
                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                           N
                                                                                                                                                         AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                     GEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD
                                                                                                                                                                                                                                                                                                                                                                                  YDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE
                                                                                                                                                                                                                                                                                                                                                                                                                         STLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                      DQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN
                                                                                                                                                                                                                                                                                                                                                                        ydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkgkgengsstde
                                                                                                                                                                                                                                                                                                                                                                                                                 stltdtlagssashvdagnqsthytraasikdvlnagwnikgvktgsttgqsenvdfvrt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ب.
                                                                                                        standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                               (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122-124; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ΑA;
                                                                                                        Protein;
                                                              entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              100.0%;
                                                                                                        589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2994; DB 20; Pred. No. 2.4e-165;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                       disease;
                     meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                         540
                                                                                                                                                                                                                                             480
                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
```

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Niha (AAU06182-AAU06186). The modified or mutant Niha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effective immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (UYQU
                                                                                                      The
                                                                                                                                                                                                                                                                                                                                                Claim 9; Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                    New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for targeting broad spectrum of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Peak
Sequence
                                                            from N. meningitidis strain (AAU06171-AAU06180) from 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                          present sequence representing the wild type surface antigen NhhA
m N. meningitidis strain P20 is 1 of 10 NhhA polypeptide sequences
U06171-AAU06180) from 10 different N. meningitidis strains given i
                                       present
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAS09163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jennings MP
    589
                                           invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "1
118..121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label=
/note= "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= C1
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers 1..50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   186.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  234..589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= V4
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            225..233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       206..224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= C3
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122..185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ٧
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                           treating
                                                                                                                                                                                                                                                                                                                                                                                                                                    from
                                                                                                                                                                   effectively
                                                                                                                                                                                                                                                                                                                                                                                                             5
C
```

Query Match
Best Local Similarity
Matches 589; Conserv

Conservative

0;

Mismatches

DB 22; 1.4e-165; s 0;

Length

0;

Gaps

0;

100.0%; Score 2994; 100.0%; Pred. No. 2

```
RESULT
AAY23743
ID AAY2
XX AAY2
XX AAY2
XX O8-S
XX Surf
KW Surf
KW Immu
XX Neis
PN W099
YX W091
YX 14-1
XX 15-1
XX 15-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÔ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                  (UYQU)
                                                                                                                                                                                                                                                          14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAY23743;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY23743
Neisseria meningitidis
                                                                                                                                                                                                                 12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                            mmunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          w
                                           1999-418754/35
DB; AAX85795.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nvapgvkegdvtnvaqlkgvaqnlnnridnvngnaragiaqaiataglaqaylpgksmma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 dftyslkkelkdltsveteklsfgangnkvnitsdtkglnfaketagtngdptvhlngig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                stltdtlagssashvdagnqsthytraasikdvlnagwnikgvktgsttgqsenvdfvrt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    esvarsalvlqfm1dkegnge1estgd1gws1yyddhntlhgatvtlkagdnlk1kqsgk
                                                                                                                                                  AIND
                                                                                                                                                                                                                                                                                                                                                                                                                       protein, surface eactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   standard;
                                                                                                          ΜP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein of Neisseria meningitidis
                                                                                                                                                  INNOVATION QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first
                                                                                                          Moxon
                                                                                                                                                                                                                 97GB-0026398
                                                                                                                                                                                                                                                          98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
    surface
                                                                                                                                                                                                                                                                                                                                                                                                                                               glycoprotein; infection; vaccine;
                                                                                                          Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   599
  proteins useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ą
  for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  48C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         48C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
```

RESULT
AAU06176
ID AAUC
XX
AC AAUC
XX
AC AAUC
XX
AC AAUC

AAU06176 standard;

4

24-OCT-2001 AAU06176;

(first entry)

```
, Qy
            δÃ
                            В
                                         ρy
                                                         B
                                                                      Š
                                                                                      B
                                                                                                  ρy
                                                                                                                   뫄
                                                                                                                                δÃ
                                                                                                                                                B
                                                                                                                                                            δÃ
                                                                                                                                                                              DЬ
                                                                                                                                                                                           Ş
                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 539; Conser
                                                                                                                                                                                                                                                                                                                                                                                meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim
                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          meningitidis infections
                                                                        469
599
              589
                                           529
                                                          479
                                                                                                     409
                                                                                                                   359
                                                                                                                                  349
                                                                                                                                                299
                                                                                                                                                              289
                                                                                                                                                                              241
                                                                                                                                                                                                           181
                                                                                                                                                                                                                          171
                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                      118
                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                   19
£
              W 589
                                                                                                                                                                                                                                                                                                dttvhlngigstltdtllntgattnvtndnvtddkkkraasvkdvlnagwnikgvkpgtt
                                                                                                                                                                                                                  DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                       1;
599
                                                                                                                                                                                                                                                                                                                                                                    599
                                                                                                                                                                                                                                                                                                                                                                                                                                             sequence
                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                           114-115; 132pp;
                                                                                                                                                                                                                                                                                                                                                                   ξ,
                                                                                                                                                                                                                                                                                                                                      90.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                            represents a surface protein of Neiserria
                                                                                                                                                                                                                                                                                                                               14;
                                                                                                                                                                                                                                                                                                                                       Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                           English
                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                       2694;
No. 5
                                                                                                                                                                                                                                                                                                                               DB 20;
5.3e-148;
hes 34;
                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                14;
                                                                                                                                                                                                                                                                                                                                                                                                               humans
                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                             298
                                                                                                                                                                                                                                                                                                   60
                                                          538
                                                                                       478
                                                                                                     468
                                                                                                                    418
                                                                                                                                  408
                                                                                                                                                 358
                                                                                                                                                              348
                                                                                                                                                                                             288
                                                                                                                                                                                                                          228
                                                                                                                                                                                                                                                                     120
                                                                                                                                                                                                                                                                                    117
                                                                                                                                                                                                                                                                                                                  60
```

240

180

ω ••

N. meningitidis H38 surface antigen

Nhha polypeptide sequence.

Ψ

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain H38 is 1 of 10 Nhha polypeptide sequences and interest and interest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       preventing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria
   (AAU06171-AAU06180) from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NhhA surface antigen polypeptides and polynucleotides from sseria meningitidis, useful in producing vaccines for treating venting broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2001-488774/53
DB; AASO9166.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fig 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           244..599
/label= C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= "Conserved 237..243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= cz
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         51..105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= V4
/note=_"Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= V3
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "Variable
l32..195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ΜP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . . 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      e= "Variable
.117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningococcal disease; meningitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   G
   10
   different
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            н38.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
meningitidis
   strains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    or.
```

Sequence

599

Region

```
RESULT
AAU06180
ID AAU
밁
                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                        DЪ
                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 539; Conser
                                                              Key
                          Region
                                                     Region
                                                                                 Neisseria
                                                                                                                                       24-OCT-2001
                                                                                                                                                         AAU06180
                                                                                                                                                                          AAU06180 standard; Protein;
                                                                                                                                                                                                                                                                                                479
                                                                                                                                                                                                                                                                                                                  469
                                                                                                                                                                                                                                                                                                                                                     409
                                                                                                                                                                                                                         599
                                                                                                                                                                                                                                          589
                                                                                                                                                                                                                                                           539
                                                                                                                                                                                                                                                                              529
                                                                                                                                                                                                                                                                                                                                     419
                                                                                                                                                                                                                                                                                                                                                                        359
                                                                                                                                                                                                                                                                                                                                                                                          349
                                                                                                                                                                                                                                                                                                                                                                                                            299
                                                                                                                                                                                                                                                                                                                                                                                                                              289
                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                   meningitidis
                                                                                                                                                                                             Ç
                                                                                                                                                                                                                       w 599
                                                                                                                                                                                                                                         W 589
                                                                                                                                                                                                                                                         a--sdnvdfvhtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                        TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            epvvrsalvlqfmidkegngenestgnigwsiyydnhntlhgatvtlkagdnlkikqntn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mnkiyriiwnsalnawvavseltrnhtkrasatvktavlatllfatvqanatdedeeeel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                               gskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiatagl
                                                                                                                                                                                                                                                                                                        GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                       -----SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ---
                                                                                                                                                                                                                                                                                                                                                                                         SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    dttvhlngigstltdtllntgattnvtndnvtddkkkraasvkdvlnagwnikgvkpgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        kntnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketagtng
                                                                                                  antigen NhhA;
                                                                                 meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                      (first entry)
                          /note=
51..10
                                                                                                                   Z2491
                 51..102
/label=
/note= "Variable region 103..114
                                            /label=
                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             90.0%;
                                                                                                  meningococcal disease; meningitis
                                                                                                                   surface
                                                                                 strain
                                  "Conserved region
                   ٧1
                                             C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    14;
                                                                                                                                                                           592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2694;
Pred. No. 5
                                                                                                                   antigen
                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                   NhhA polypeptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; DB 22;
5.3e-148;
hes 34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                   vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                          408
                                                                                                                                                                                                                                                            598
                                                                                                                                                                                                                                                                              588
                                                                                                                                                                                                                                                                                                538
                                                                                                                                                                                                                                                                                                                 528
                                                                                                                                                                                                                                                                                                                                     478
                                                                                                                                                                                                                                                                                                                                                     468
                                                                                                                                                                                                                                                                                                                                                                        418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                           358
                                                                                                                                                                                                                                                                                                                                                                                                                                               298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              117
```

```
В
                                  Q
                                                      망
                                                                      δÃ
                                                                                                                                       Š
                                                                                         Query Match
Best Local Similarity
Matches 531; Conser
                                                                                                                                                            The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain Z2491 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                             New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                               Claim 9;
                                                                                                                                                                                                                                                                                                                                                    N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                  25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                     25-JAN-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                UQYU)
 118
                  61
                                    61
                                                                         _
                                                   esvqrs-vvgsiqasmegsgelet---islsmtndskefvdpyivvtlkagdnlkikqnt
                                   ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHG-ATVTLKAGDNLKIKQ--
                                                                                                                                                                                                                                                                                                                                                            2001-488774/53
                                                                                                                                                                                                                                                                                                                                                                                                UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                    AAS09170
-SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPT
                                                                                                                                                                                                                                                                                              Fig 1;
                                                                                                                                                                                                                                                                                                                                                                            Jennings MP,
                                                                                                                                       592
                                                                                         Conservative
                                                                                                                                                        invention
                                                                                                                                                                                                                                                                                                                                                                                                                 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                     2001WO-AU00069
                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= V3
/note= "Variable :
209..227
                                                                                                                                                                                                                                                                                             91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= "
237 .592
/label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note=
115..1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Conserved 228..236"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Variable
l25..188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label= V4
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              189.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      note= "Conserved"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ..124
                                                                                                 87.7%;
89.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             . 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             208
                                                                                                                                                                                                                                                                                              English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C4
                                                                                         13;
                                                                                       Score 2626.5;
Pred. No. 4.2e
13; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ŋ
                                                                                                  .2e-144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2
                                                                                                          DB 22;
                                                                                         41;
                                                                                         Indels
                                                                                                          Length
                                                                                                           592;
                                                                                         11;
                                                                                       Gaps
                 116
                                                      60
                                                                      60
                                                                                                                                                                                                                                                                                                                        õ
                                                                                         4
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
20
                                                                                                                                                                                                                                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
       surface glycoproteins, nucleic acids, a thermostable polymerase, or antibodi
```

```
RESULT
AAY23738
Claim 1;
                        Neisseria meningitidis surface meningitidis infections
                                                                                                                               (ISIS<sup>±</sup>)
                                                                                                                                                                                                                                                                                                                                                                                                                       AAY23738
                                                                                                     Jennings
                                                                                                                                                                     12-DEC-1997;
                                                                                                                                                                                               14-DEC-1998;
                                                                                                                                                                                                                                                                                                                Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                      08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                              AAY23738
                                                                                                                                                                                                                         24-JUN-1999.
                                                                                                                                                                                                                                                   WO9931132-A1
                                                                                                                                                                                                                                                                          Neisseria meningitidis
                                                                                                                                                                                                                                                                                                     immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            117
                                                                                                                                                                                                                                                                                                                                           surface
                                                                                                                                                                                                                                                                                                                                                                                                                                               6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nentnassftyslkkdltglinveteklsfgangkkvniisdtkglnfaketagtngdtt
                                                                             1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ngsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      nvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkgkge
                                                                                                                               J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     pgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            detvninagnnieisrngknidiatsmapqfssvslgagadaptlsvddegalnvgskda
                                                                                                                               UNIV
 Page
                                                                                                       ΜP,
                                                                                                                                                                                                                                                                                                                                                                                                                       standard;
                                                                                                                                                                                                                                                                                                                                         protein
                                                                                                                               INNOVATION QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                   (first entry)
91-93; 132pp;
                                                                                                     Moxon
                                                                                                                                                                     97GB-0026398
                                                                                                                                                                                               98WO-AU01031
                                                                                                                                                                                                                                                                                                   peptide
                                                                                                                                                                                                                                                                                                                                            of.
                                                                                                                                                                                                                                                                                                                                                                                                                        Protein;
                                                                                                       ER,
                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                             LTD
                                                                                                        Peak
                                                                                                                                                                                                                                                                                                                                                                                                                        598
English.
                                      proteins useful for treating
                                                                                                                                                                                                                                                                                                                                            meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                        Æ
                                       z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            176
```

The present sequence represents a surface protein of meningitidis which is approximately 62 kDa. The N.

of Neiserria nd optionally in a kit for

or antibodies are useful in of N. meningitid:

```
RESULT
AAU06178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SSSSSS
                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                  Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
  밁
                                                                                                                                                                                                                  ð
                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
Key
Region
                                                                            N. meningitidis
                                                                                                                                          AAU06178 standard; Protein; 598
                                                      Surface antigen
                                                                                                 24-OCT-2001
                                Neisseria
                                                                                                                                                                                               598
                                                                                                                                                                                                                    589
                                                                                                                                                                                                                                                                                     478
                                                                                                                                                                                                                                                                                                          469
                                                                                                                                                                                                                                                                                                                               418
                                                                                                                                                                                                                                                                                                                                                                                              349
                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                         538
                                                                                                                                                                                                                                                               529
                                                                                                                                                                                                                                                                                                                                                    409
                                                                                                                                                                                                                                                                                                                                                                         358
                                                                                                                                                                                                                                                                                                                                                                                                                    298
                                                                                                                                                                                                                                                                                                                                                                                                                                        289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Match
                                                                                                                                                               7
                                                                                                                                                                                               ٤
                                                                                                                                                                                                                    ε
                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                              GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                            KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                            a--sdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           D------FTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                   gskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiatagl
                                                                                                                                                                                                                                                                                                                                                   SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                                                                                                                                                                  kgkgengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtkvtfa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           epvqrtavvlsfrsdkegtgekegtedsnwavyfdekrvlkagaitlkagdnlkikqntn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     mnkisriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd-dddlyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       dptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 entnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketagtng
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  al Similarity
527; Conser
                                                                                                                                                                                                                    589
                                meningitidis strain BZ10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                               (first entry)
                                                                            BZ10
Location/Qualifiers 1..50
                                                      NhhA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            87
                                                                            surface
                                                     meningococcal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           . 78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2616.5; DB 20; Pred. No. 1.6e-143; 8; Mismatches 41;
                                                                          antigen NhhA polypeptide
                                                                                                                                           B
                                                      disease;
                                                     meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                          sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       59
                                                                                                                                                                                                                                         597
                                                                                                                                                                                                                                                              588
                                                                                                                                                                                                                                                                                                        528
                                                                                                                                                                                                                                                                                                                                477
                                                                                                                                                                                                                                                                                                                                                   468
                                                                                                                                                                                                                                                                                                                                                                        417
                                                                                                                                                                                                                                                                                                                                                                                             408
                                                                                                                                                                                                                                                                                                                                                                                                                    357
                                                                                                                                                                                                                                                                                                                                                                                                                                       348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     170
                                                                                                                                                                                                                                                                                  537
                                                                                                                                                                                                                                                                                                                                                                                                                                                              297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4;
```

Ф Qy

Query Match Best Local Matches

Local Similarity hes 527; Conserv

Conservative

18;

Score 2616.5; DB 22; Pred. No. 1.6e-143; 8; Mismatches 41;

Indels Length

Gaps

4

59 60

598 15;

87.4**%**; 87.7**%**;

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen NhhA from N. meningitidis strain BZ10 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                         WPI; 200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                     Claim 9; Fig 1;
                                                                                                                                                                                                                                                                                                                                                                        New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                           2001-488774/53
DB; AAS09168.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2000US-0177917
  A.
                                                                                                                                                                                                                                                                                                                                   91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "1
243..598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note= "(
117..130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Conserved 236..242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label= V3
/note= "Variable
217..235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                195..216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label= V4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                note= "Conserved"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          note= "Variable"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             105..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C1
Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   <u>۷</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <u>∨</u>1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2
                                                                                                                                                                                                                                                                                                                                                                                                 treating
                                                                                                                                                                                                                                                                                                                                                                                                   or
```

```
RESULT
AAY23742
ID AAY2
XX AAY2
XX AAY2
XX O8-S
XX O8-S
XX Surf
KW immu
XX Neis
PN WO9!
XX WO9!
XX I4-I
XX I4-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                 (ISIS-)
                                                                                                                                                                                                                  14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                    Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY23742;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAY23742 standard;
                                                                                                                                                                              12-DEC-1997;
                                                                                                                                                                                                                                                                                              WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                           immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                 surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1999-418754/35
DB; AAX85794.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ٤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ε
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               epvqrtavvlsfrsdkegtgekegtedsnwavyfdekrvlkagaitlkagdnlkikqntn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ESVARSALVLQEMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aqaylpgksmmaigggtyrgeagyaigyssisdtgnwvikgtasgnsrghfgtsasvgyq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gskdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiatagl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSKDANKPYRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKYTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                   VINU
                                                                                                                                                                                                                                                                                                                                                                                         protein;
                                                                             ΜP,
                                                                                                                                                                                                                                                                                                                                                                                                                                 protein
                                                                                                                 INNOVATION QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first
                                                                               Moxon
                                                                                                                                                                                                                                                                                                                                                                         n; surface
peptide.
                                                                                                                                                                            97GB-0026398
                                                                                                                                                                                                                  98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                               of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        entry)
                                                                               Peak
                                                                                                                                                                                                                                                                                                                                                                                           glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     598
                                                                               IRA;
                                                                                                                                                                                                                                                                                                                                                                                             infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        239
```

RESULT
AAUU6177
ID AAUU
XX
AC AAUU
XX

AAU06177 standard;

598

₹

9

AAU06177

```
Š
                                                                                                                                                                                       Ş
                                                                                                                                                                                                          밁
                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                В
                                               Qγ
                                                                 밁
                                                                                                    밁
                                                                                                                  οy
                                                                                                                                     뫄
                                                                                                                                                     Qy
                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 525; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                             The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidi surface glycoproteins, nucleic acids, the primers and optional a thermostable polymerase, or antibodies are useful in a kit f the detection or diagnosis of N. meningitidis infection in hum The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especial in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim
                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
598
               589
                                 538
                                                  529
                                                                  478
                                                                                   469
                                                                                                    418
                                                                                                                    409
                                                                                                                                     358
                                                                                                                                                      349
                                                                                                                                                                        298
                                                                                                                                                                                          289
                                                                                                                                                                                                          240
                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                            171
                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                           229
                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                   \vdash
                                                                                                                                                                                                                                                                                                                                                ξ
            - E
                                                                DPTVHLNGIGSTLTDTLAGSSASHVDAGNOST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                         ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                           dptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtt
                                                                                                                                                                                                                                                                                                              epvqrtavvlsfrsdkegtgekegtedsnwavyfdekrvlkagaitlkagdnlkikqntn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ۲.
               589
598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Page
                                                                                                                                                                                                                                                                                                                                                                                                                             598
                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  108-110; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                           87.2%; Score
87.4%; Pred.
                                                                                                                                                                                                                                                                                                                                                                                   19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            proteins
                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                  e 2610.5; DB 20
. No. 3.5e-143;
ismatches 42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein of Neiserria
a. The N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                    20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            treating
                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         optionally
n a kit for
                                                                                                                                                                                                                                                                                                                                                                                                                                                       especially
can also
                                                                                                                                                                                                                                                                                                                                                                                   15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              z
                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                     468
                                                                                                                                                      408
                                                                                                                                                                                                                                                                              179
                                                                                                                                                                                                                                                                                                                                                 59
                                                                   537
                                                                                                     477
                                                                                                                                      417
                                                                                                                                                                                                                                                            228
                                                                                                                                                                                                                                                                                              170
                                                                                                                                                                                                                                                                                                                                                                   60
                                  597
                                                  588
                                                                                                                                                                        357
                                                                                                                                                                                         348
                                                                                                                                                                                                           297
                                                                                                                                                                                                                            288
                                                                                                                                                                                                                                             239
```

4.

-OCT-2001

4

```
the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
                                                                                                                                                                                                   The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly
                                                                                                                                                                                                                                                                                                            Claim 9;
                                                                                                                                                                                                                                                                                                                                                New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for t preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24
                 The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain H15 is 1 of 10 NhhA polypeptide sequence (AAU06171-AAU06180) from 10 different N. meningitidis strains given
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   25-JAN-2000; 2000US-0177917.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Peak IRA, Jennings MP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
present
                                                                                                                                                                                                                                                                                                                                                                                                                                      2001-488774/53.
DB; AASO9167.
                                                                                                                                                                                                                                                                                                            Fig 1; 91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       meningitidis strain H15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Conserved 236..242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note= "Variable 217..235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NhhA; meningococcal disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label= V4
/note= "Variable region
243..598
/label= C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "Conserved
l17..130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= C3
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            'label= v1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             194
                                                                                                                                                                                                                                                                                                            English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ٧3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <u>__</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ຫຼ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                        treating
                                                                                                                                                                                                                                                                                                                                                                                           from
                                                                                                                                                                                                                                                                                                                                                                        OF,
```

```
δÔ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query
                                                                                                                                                                                Neisseria
bacterial
                                                                                                                                                                                                                                                                                                                                                                                        203
                                                                                                   WO9936544-A2
                                                                                                                                         Neisseria
                                                                                                                                                                                                                                             Amino acid
                                                                                                                                                                                                                                                                                                                          AAY27203;
                                                                                                                                                                                                                                                                                                                                                                 AAY27203 standard; Protein; 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                              22-JUL-1999.
                                                                                                                                                                                                                                                                                  24-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                         10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   w 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              skgkmdetvnin agnnie itrngknid i atsmtpq fssvsl gagadaptl svdde galnvar and svar and start and 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sgngttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  dptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        al Similarity
525; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        589
                                                                                                                                         meningitidis
                                                                                                                                                                                meningitidis protein; pharmaceutical;
infection; treatment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          598
                                                                                                                                                                                                                                           sequence of N. meningitidis protein ORF40a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         87.2%;
87.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pred. No. 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2610.5;
                                                                                                                                                                                                                                                                                                                                                                 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .5e-143;
es 42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 22;
                                                                                                                                                                                                   vaccine; diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
```

14-JAN-1999;

99WO-IB00103

```
δÃ
                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                         ğ
                                                                                                                                                                                                                                                                                                                                               В
                                                                                        밁
                                                                                                             80
                                                                                                                                    DЬ
                                                                                                                                                    Qy
                                                                                                                                                                            뫄
                                                                                                                                                                                              Q
                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                δã
                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                   밁
                                                                   δ
          В
                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           09-OCT-1998;
14-JAN-1998;
01-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The invention provides proteins (AAY27201-245) from Neisseria meningitidis (strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g. a vaccine composition or a diagnostic composition. The composition is also useful for treating or preventing an infection due to Neisserial bacteria, especially Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            New protein and its nucleotide sequence, useful in vaccines or diagnostic compositions for treating and/or preventing Neisseria meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (CHIR-)
           537
                               534
                                                    477
                                                                       474
                                                                                            417
                                                                                                               414
                                                                                                                                     357
                                                                                                                                                       354
                                                                                                                                                                             297
                                                                                                                                                                                                 294
                                                                                                                                                                                                                     237
                                                                                                                                                                                                                                        234
                                                                                                                                                                                                                                                               177
                                                                                                                                                                                                                                                                                  174
                                                                                                                                                                                                                                                                                                       117
                                                                                                                                                                                                                                                                                                                           118
                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                       _
                                                                                                                                                                                                                                                                                                                                                                                     DETVNINAGNNIEITRNGKNIDIATSWTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
                                                                                                                                 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGE
                                                                                                                                                                                                                                                                       VHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSE
                                                                                                                                                                                                                                                                                                                                          1999-444400/37
DB; AAX99125.
                   PGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                          NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT
                                                                                                                                                                                                                                                            vhlngigstltdtlagssashvdagnxsthytraasikdvlnagwnikgvkxgsttgqse
                                                                                                                                                                                                                                                                                                    nentnass \verb|ftys|| k k d | \verb|tg|| in vx tekls \verb|fgang|| k v n i i s d t k g l n f a k e t a g t n g d t t
                                                                                                                                                                                                                                                                                                                                                         ESVARSALVLQFWIDKEGNGEIESTGDIGWSIYYDDHNTLHG-ATVTLKAGDNLKIKQ--
          pgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                            ngsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkgt
                                                                                                                                                                                                                    nvdfvrtydtveflsadtxtttvnveskdngkrtevkigaktsvikekdgklvtgkgkge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ó
                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                              -SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Masignani
                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             98GB-0022143.
98GB-0000760.
98GB-0019015.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       123pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                        86.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pizza
                                                                                                                                                                                                                                                                                                                                                                                                                               13;
                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2580.5;
Pred. No. 1.9e
13; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rappuoli
                                                                                                                                                                                                                                                                                                                                                                                                                              .9e-141;
les 48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scarlato
                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                               11;
          592
                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                      413
                                                                                                                                                                                                                                                                                                       176
                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                           476
                                                                                                               473
                                                                                                                                                                                                353
                                                                                                                                                                                                                                                                                 233
                                                                                                                                                                                                                                                                                                                          173
                                                    536
                                                                                                                                                                            356
                                                                                                                                                                                                                    296
                                                                                                                                                                                                                                        293
                                                                                                                                                                                                                                                            236
                                                                                                                                                                                                                                                                                                                                                                                                                               4.
                                         밁
                                                         Qγ
                                                                               В
                                                                                                  Qy
                                                                                                                         В
                                                                                                                                         QY
                                                                                                                                                                 밁
                                                                                                                                                                                   δÃ
g
                  Qy
```

```
RESULT 1
AAY23733
ID AAY2
XX AAY2
XX AAY2
XX AAY2
XX Surf
KW Surf
KW immu
XX Neis
PN W099
XX Neis
PN W11-1
XX 14-1
XX 14-1
PA (UY(
XX N-P(
PT Men.
XX N-P(
XX 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in human The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 1999-418754/35.
N-PSDB; AAX85791.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ( UQYU)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Surface protein; immunoreactive pr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAY23739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           24 - JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                            180
                                                                                                                                        175
                                                                                                                                                                                      120
                                                                                                                                                                                                                                  121
  238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       surface
                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                              19
                                                                                                                                                                               ENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKG
                                                                                                                                                                                                                                                                                                        ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK
                                                                                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
dnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgklvtgkgkd
                                                                                                                  HLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQS
                                                                                                                                                                                                                                                                                epvqrtavvlsfrsdkegtgekegtedsnwavyfdekrvlkagaitlkagdnlkikqntn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      al Similarity
517; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INNOVATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      95-97; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            . 6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2573.5;
Pred. No. 4.8e
20; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the primers and optionally
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1.8e-141;
nes 49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     especially
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      kit for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                            59
                                                                                                                                                                                        179
                                                                                                                                                                                                                                    174
                                                                                                                                          232
                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                              237
```

4.

```
RABSULT 12
AAU061
XX AAU061
XX AAU061
XX Surfac
XX Surfac
XX Surfac
XX Surfac
XX Surfac
XX Region
FT Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAU06179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAU06179
 (UYQU)
                        25-JAN-2000;
                                                                                            WO200155182-A1
                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria meningitidis strain
                                              25-JAN-2001;
                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \verb|mdetvninagnnie| itrngknid| iats \verb|mapqfssvslgagadaptlsvddegalnvgskd|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tnkpvritnvapgvkegdvtnvaglkgvaqnlnnridnvdgnaragiagaiataglvqay
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     lpgksmmaiggdtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
 UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     antigen NhhA; meningococcal disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
 QUEENSLAND
                        2000US-0177917
                                              2001WO-AU00069
                                                                                                                          /label= V4
/note= "Variable r
239..594
/label= C5
                                                                                                                                                                         /note=
232..2
                                                                                                                                                                                                        /note= "Variable
213..231
                                                                                                                                                                                                                                                                                                           /note= "Conserved 117..126
                                                                                                                                                                                                                                                                                                                                                                             /note= "Conserved 51..104
                                                                                                                                                                                                                                                                                                                                            /note= "Variable
105..116
                                                                                                                                                                                                                                          /note=
191..2
                                                                                                                                                                                                                                                                           /note=
127..19
                                                                                                                                                                                                                                                                                                                                  /label=
                                                                                                                 'note=
                                                                                                                                                                                                /label=
                                                                                                                                                                                                                                 /label≃
                                                                                                                                                                                                                                                                 /label=
                                                                                                                                                                                                                                                                                                  /label=
                                                                                                                                                                                                                                                                                                                                                                   /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                     /label=
                                                                                                                                                                                                                                                                                                                                                                                                                          location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Protein;
                                                                                                                                                                         . 238
                                                                                                                                                                                                                                                                             190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface antigen NhhA polypeptide sequence
                                                                                                                 "Conserved
                                                                                                                                                                                   "Conserved
                                                                                                                                                                                                                                                    "Conserved
                                                                                                                                                                                                                                                                                     "Variable
                                                                                                                                                                                                                                                                                                                                                                                                      Cl
                                                                                                                                                                                                C4
                                                                                                                                                                                                                                 ٧
                                                                                                                                                                                                                                                                                                                                   C2
                                                                                                                                                                                                                                                                 C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              594
                                                                                                                                                                                                                                                                                                                                                                                                                                               BZ198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA
                                                                                                                                                  region
                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                        region
                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                   region
                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                         ۳,
                                                                                                                                                                                                                                                      w
                                                                                                                                                                                                                                                                                                                       Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   357
```

```
Ş
                                                        뫄
                                                                                  Q
                                                                                                                   B
                                                                                                                                              δõ
                                                                                                                                                                             В
                                                                                                                                                                                                       δã
                                                                                                                                                                                                                                       뭉
                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                 ρV
                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain BZ198 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-PSDB;
538
                             533
                                                          478
                                                                                       473
                                                                                                                    418
                                                                                                                                                413
                                                                                                                                                                              358
                                                                                                                                                                                                          353
                                                                                                                                                                                                                                                                                              238
                                                                                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                                                                                                      175
                                                                                                                                                                                                                                       298
                                                                                                                                                                                                                                                                   293
                                                                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                   120
                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                              D-----FTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTV
                                                                                                                                                                                            TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                              LPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                        tnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqay
                                                                        ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY
                                                                                                                   \verb|mdetvninagnnie| itrngknid| iats \verb|mapqfssvslgagadaptlsvddegalnvgskd|
                                                                                                                               MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                             ttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgk
                                                                                                                                                                                                                                      engsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkg
                                                                                                                                                                                                                                                    ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNG
                                                                                                                                                                                                                                                                                                                                                                                                                  entndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketagtngdptv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          epvgrtavvlsfrsdkegtgekegtedsnwavyfdekrvlkagaitlkagdnlkikqntn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     mnkiyriiwnsalnawvvvseltrnhtkrasatvatavlatllfatvqanatd-dddlyl
lpgksmmaiggdtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             al Similarity
517; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAS09169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             86.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2573.5;
Pred. No. 4.8e
20; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .8e-141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11;
                             589
 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                    477
                                                                                                                                                472
                                                                                                                                                                              417
                                                                                                                                                                                                          412
                                                                                                                                                                                                                                                                   352
                                                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                                                                                          237
                                                                                                                                                                                                                                                                                                                                                                                      232
                                                                                                                                                                                                                                                                                                                                                                                                                   179
                                                                                                                                                                                                                                                                                                                                                                                                                                               174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     or
                                                                                                                                                                                                                                       357
                                                                                                                                                                                                                                                                                                                             292
```

4.

```
RESULT 1
AAY23740
                                                                                              QΥ
                                                                                                                       В
                                                                                                                                         Qy
                                                                                                                                                                   В
                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                  Qγ
                                   밁
                                                      Qy
                                                                             Ъ
                                                                                                                                                                                                                      Query Match
Best Local :
                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                 meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans prevent a transfer of the detection or diagnosis of N. meningitidis infection in humans are not provent as a surface glycoproteins can also be a surface glycoproteins.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (ISIS-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A surface protein of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAY23740 standard;
                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                              prevent
                                                                                                                                                                                                                                                                                                                                                                                                  Claim
                                                                                                                                                                                                                                                                                                                                                                                                                       meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Surface protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAY23740;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       immunoreactive peptide.
              233
                                                                              120
                                    180
                                                                                                  118
                                                                                                                        60
                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             13
                                                                                                                                                                                                                                                                                                   the
                                                                                                                                                                    _
                                                                                                                                                                           1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL 60
                                                                           hlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtta--s
                                             HLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQS
                                                                                                                      epvqrtavvls frsd kegtge kevted snwgvyfdkkgvltagtitlkagdnlkikqntn\\
                                                                                                                                          ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ---
                                                                                                                                                                 mnkiyriiwnsalnawvavseltrnhtkrasatvatavlatllfatvqasttd-dddlyl
                                                                                                                                                                                                                                                                                                                                                                                                  ۲.
                                                                                                                                                                                                                                                                                               meningitidis surface glycoproteins can also be used to tor treat N. meningitidis infection in humans, especially form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ISIS
                                                                                                                                                                                                                                                                                       б
                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ď,
                                                                                                                                                                                                                                                                                                                                                                                                 Page 100-101;
                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitidis surface
                                                                                                                                                                                                                                                                                     identify immunoreactive peptides.
                                                                                                                                                                                                                                                                  594 AA;
                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INNOVATION QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                surface glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ER,
                                                                                                                                                                                                                      84.1%;
85.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LTD
                                                                                                                                                                                                            19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                      Pred. No.
                                                                                                                                                                                                                                 Score 2516.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ŗ
                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                infection; vaccine;
                                                                                                                                                                                                                        9.6e-138;
                                                                                                                                                                                                                                 DB 20;
                                                                                                                                                                                                            58;
                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                 594;
                                                                                                                                                                                                            11;
                                                                                                                                                                                                                                                                                                                                 humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                 z
                                                                                                                                                                                                          Gaps
                                                                                                                      119
                                                                                                                                                                 59
                                  237
             292
                                                                                                                                                                                                            4;
```

```
RESULT 1
AAX'5704
ID AAX'5704
XX AAY'5704
XX AAY'5704
XX AAY'5704
XX AAY'5704
XX BASE
XX BASE
XX Infe
XX Infe
XX Neis

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             рЬ
This is the Nisseria meningitidis BASB029 amino acid sequence from serogroup B strain ATCC13990. The BASB029 protein is homologous to the Haemophilus influenzae surface fibril (HSF) protein. The invention relates to BASB029 polynucleotide sequences (AAZ39864-Z39865) and polypeptide sequences (AAY57044-Y57045) and their immunogenic fragments. BASB029 polynucleotides are useful in amethod of diagnosing a Neisseria meningitidis infection in a mammal. Compositions containing BASB029 polynucleotides are useful in amethod for generating an immune response in an animal. A therapeutic composition comprising an animal directed against BASB029 is useful in treating humans with Neisseria meningitidis disease. The polynucleotide is useful in the diagnosis of
                                                                                                                                                                                                                                                                                                                          Claim 4; Fig
                                                                                                                                                                                                                                                                                                                                                                            New polypeptide from neisseria meningitidis useful treatment or prevention of bacterial infections in
                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ruelle J;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BASB029 amino acid sequence from N. meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY57044;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAY57044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY 532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ankpvritnvapgvkegdvtnvaqlkgvaqnlnnhidnvdgnaragiaqaiataglvqay
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             dnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkdkg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2000-053103/04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Nisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    treatment;
                                                                                                                                                                                                                                                                                                                        2; 74pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis;
ent; prevent; ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                                                                                          English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; surface fibril protein;
antibacterial drug.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AATC'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fibril
                                                                                                                                                                                                                                                                                                                                                                                                       for diagnosis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATCC13090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   297
```

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                  Д
                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                       Дβ
                                                                                                                                                                                                                                                                                                                                                                                                                                                οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                     дb
                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029 polynucleotides and polypeptides are also useful for treating infections particularly bacterial infections. The protein is useful in the screening and development of antibacterial drugs. Fused recombinant protein is useful for the stimulation of the immune system of an organism
                                                  Surface antigen
                                                                                                                                                    AAU06174 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         receiving the protein.
                          Neisseria
                                                                                                      24-OCT-2001
                                                                                                                                                                                                                     538
                                                                                                                                                                                                                                             533
                                                                                                                                                                                                                                                                                                                       418
                                                                                                                                                                                                                                                                                                                                                413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             238
                                                                                                                                                                                                                                                                                                                                                                          358
                                                                                                                                                                                                                                                                                                                                                                                                  353
                                                                                                                                                                                                                                                                                                                                                                                                                           298
                                                                                                                                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                            meningitidis
                                                                                                                                                                                                                                LPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW 589
                                                                                                                                                                                                                                                                                                                                                                      ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY
                                                                                                                                                                                                                                                                                                                                   MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                     ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                 lpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                                      mdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddegalnvgskd
                                                                                                                                                                                                                                                                                                                                                                                                                         endsstdkgeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkdkg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mnkiyriiwnsalnawvavseltrnhtkrasatvatavlatllfatvqasttd-dddlyl
                                                                                                                                                                                                                                                                    ankpvritnvapgvkegdvtnvaqlkgvaqnlnnhidnvdgnaragiaqaiataglvqay
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               epvqrtavvlsfrsdkegtgekevtedsnwgvyfdkkgvltagtitlkagdnlkikqntn
                          meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                    (first
                                                 NhhA; meningococcal disease;
                                                                            EG327
 Location/Qualifiers
                                                                                                                                                     Protein;
                                                                                                    entry
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               84.1%;
85.3%;
                                                                            surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; Score 2516.5; DB 21;
; Pred. No. 9.6e-138;
19; Mismatches 58; 1
                                                                                                                                                     594
                          EG327
                                                                           antigen NhhA polypeptide
                                                                                                                                                       AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --
::
                                                 meningitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                   vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                       477
                                                                                                                                                                                                                                                                                                                                                472
                                                                                                                                                                                                                                                                                                                                                                          417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                           357
                                                                                                                                                                                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4;
```

QΥ

1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL

Query Match Best Local Sin Matches 509;

Similarity 85.3 )9; Conservative

19;

84.1%;

Score 2516.5; Pred. No. 9.6e 19; Mismatches

.6e-1 DB 22;

Indels Length

11;

Gaps

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                  New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria menangitidis -
Sequence
                                would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhA from N. meningitidis strain EG327 is 1 of 10 NhA polypeptide sequence: (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                              Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                  WPI; 2001-488774/53.
N-PSDB; AAS09164.
                                                                                                                                                                                                                                                                                                                                                  25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                         25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                      WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                           OZYU)
                     present
                                                                                                                                                                                                                                                                                                                          ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                    Jennings MP
                      invention.
 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   239.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "(
232..238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note= "(
117..126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1..50
/label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label= V3
/note= "Variable
213..231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= V4
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "Variable
127..190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         . 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                            "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                       C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ∑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       region
                                                                                                                                                                                                                                                                                                                                                                                                                                           region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                 treating
                                                                                                                                                                                                                                             from
```

```
·Ωy
          Š
                     밁
                              Š
                                          В
                                                 δÃ
                                                              B
                                                                        δÃ
                                                                                  Вb
                                                                                            Qy
                                                                                                       Ър
                                                                                                               Ş
                                                                                                                           밁
                                                                                                                                                Вр
                                                                                                                                                         QΥ
                                                                                                                                                                     В
                                                                                                                                                                               δÃ
                                                                                                                                                                                          밁
  538
            533
                      478
                                473
                                          418
                                                    413
                                                               358
                                                                        353
                                                                                   298
                                                                                             293
                                                                                                        238
                                                                                                                  233
                                                                                                                            180
                                                                                                                                      175
                                                                                                                                                120
                                                                                                                                                           118
                                                                                                                                                                     60
                                                                                                                                                                               61
                                                                                                                                                                                          \vdash
                                                                                                                                               ANKPERITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY 532
                                         hlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtta--s
                                                                                                                                 HLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQS
                                                                                                                                                                    mnkiyriiwnsalnawvavseltrnhtkrasatvatavlatllfatvqasttd-dddlyl
                                                                                                                                                                               ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ----
                                                                                                                                                          174
                                                                                                                                      232
                                                                                                                                                179
                                                                                                                                                                     119
                                                                                  357
                                                                                            352
                                                                                                                            237
                                                                                                                                                                                          59
                                                                                                       297
                                                                                                                 292
```

Search completed: July 3, 2002, 08:09:05 Job time: 491 sec THIS PAGE BLANK (USPTO)

```
Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred. No. is the score greater that and is derived
                                                              2462.5
2462.5
2462.5
1179.5
1179.5
1179.5
1179.5
1178.5
                                                                                                                                                                                                                                                                   2616.5
2616.5
2610.5
2610.5
2610.5
2610.5
2573.5
2573.5
2516.5
2490.5
2490.5
2479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2994
2994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Issued_Patents_AA:*
1: /cgn2_6/ptodata/2,
2: /ggn2_6/ptodata/2,
3: /cgn2_6/ptodata/2,
4: /cgn2_6/ptodata/2,
5: /ggn2_6/ptodata/2,
6: /cgn2_6/ptodata/2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      length: 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        is the number of results predicted by chance to have a ater than or equal to the score of the result being printed, rived by analysis of the total score distribution.
        1000.0
1900.0
900.0
90.0
87.2
887.2
887.2
884.1
884.1
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
883.2
863.2
863.2
863.2
863.2
863.2
863.2
863.2
863.2
863.2
863.2
863.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             231628 seqs, 24425594 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-771-382-3
2994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   July 3, 2002, 08:10:14; Search time 64.11 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MNKIYRIIWNSALNAWVVVS.....TASGNSRGHFGTSASVGYQW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/BCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
        598
598
594
594
594
592
592
592
591
591
591
592
592
592
593
593
593
593
593
594
594
594
594
594
594
594
594
594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
     US-09-377-155-19
US-09-669-974-15
US-09-669-974-15
US-09-669-974-15
US-09-669-974-15
US-09-669-974-17
US-09-669-974-17
US-09-69-974-17
US-09-377-155-33
US-09-373-155-33
US-09-373-155-33
US-09-373-155-33
US-09-373-155-33
US-09-373-155-33
US-09-373-155-33
US-09-373-155-33
US-09-373-155-33
US-09-373-155-33
US-09-388-347-47
US-09-268-347-36
US-08-409-995-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (without alignments)
224.406 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            231628
Sequence 19, Appl
Sequence 15, Appl
Sequence 15, Appl
Sequence 5, Appli
Sequence 5, Appli
Sequence 7, Appli
Sequence 13, Appli
Sequence 7, Appli
Sequence 7, Appli
Sequence 9, Appli
Sequence 17, Appl
Sequence 17, Appl
Sequence 17, Appl
Sequence 21, Appl
Sequence 21, Appl
Sequence 21, Appli
Sequence 22, Appli
Sequence 23, Appli
Sequence 33, Appli
Sequence 33, Appli
Sequence 47, Appli
Sequence 47, Appli
Sequence 47, Appli
Sequence 33, Appli
Sequence 33, Appli
Sequence 47, Appli
Sequence 47, Appli
Sequence 47, Appli
Sequence 37, Appli
Sequence 37, Appli
Sequence 37, Appli
Sequence 37, Appli
Sequence 27, Appli
Sequence 37, Appli
Sequence 37, Appli
Sequence 27, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Description
     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; ORGANISM: Neisseria meningitidis US-09-377-155-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 1
US-09-377-155-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 19
LENGTH: 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 19, Application Patent No. 6197312 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: PEAK, IAn RICHARD ANSelm
APPLICANT: JENNINGS, MICHAEL PAUL
APPLICANT: MOXON, E. RICHARD
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0118
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION NUMBER: PCT/AU98/01031 PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: PRT
```

Database

Result

ö.

45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28
708.5	771.5	774.5	1001.5	1064	1064	1121	1121	1121	1121	1121	1158.5	1158.5	1158.5	1169.5	1169.5	1169.5	1169.5
23.7	25.8	25.9	33.5	35.5	35.5	37.4	37.4	37.4	37.4	37.4	38.7	38.7	38.7	39.1	39.1	39.1	39.1
1104	1002	1004	1094	679	679	1912	1912	607	607	607	658	658	658	1098	1098	1098	1098
4	4	4	4	4	4	w	μ.	4	w	_	4	w	1	4	4	4	4
US-09-268-347-28	US-09-268-347-24	US-09-268-347-30	US-09-268-347-32	US-09-268-347-26	US-08-913-942-15	US-08-685-467-4	US-08-409-995-4	US-08-913-942-6	US-08-685-467-6	US-08-409-995-6	US-08-913-942-5	US-08-685-467-5	US-08-409-995-5	US-09-268-347-44	US-09-669-974-32	US-08-913-942-2	US-09-377-155-32
Sequence 28, Appl	Sequence 24, Appl	-	Sequence 32, Appl	•	Sequence 15, Appl	Sequence 4, Appli	Sequence 4, Appli	Sequence 6, Appli	Sequence 6, Appli	Sequence 6, Appli	Sequence 5, Appli	Sequence 5, Appli	Sequence 5, Appli	Sequence 44, Appl	Sequence 32, Appl	Sequence 2, Appli	Sequence 32, Appl

## ALIGNMENTS

US/09377155

	360	301 GEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD 360	Qy
	300	241 YDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE	Db
	300		Qy
	240	-	Db
	240	181 STLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRT	Qy
	180	121 DFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIG	Db
	180		Qγ
	120	61 ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK	DЬ
	120		Qy
	60	1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL 60	Db
	60	1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL 60	Qу
0;	sqı	vative 0;	Matc
		Query Match 100.0%; Score 2994; DB 4; Length 589;	Quer

```
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GE 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN VET. 2.0
SEQ ID NO 19
LENGTH: 589
             Ş
                                       뫄
                                                           Qy
                                                                                       В
                                                                                                              QΥ
                                                                                                                                        밁
                                                                                                                                                              δÃ
                                                                                                                                                                                            ₽
                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δδ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 2
US-09-669-974-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
Matches 589; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 19, Application US/09669974
Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                  LENGTH: 589
TYPE: PRT
ORGANISM: Neisseria meningitidis
-09-669-974-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE J
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: PEAK,
                                                                                                                  181
                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                        241
                                                                                          181
                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
              301
                                                                                                                                                                                             61
                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                 L
                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL 60
                                                   YDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE
                                                                                                                                                         DFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN
            GEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD
                                                                                                      STLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRT
                                                                                                                                          DFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT
                                     YDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE
                                                                                        STLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT
100.0%; ilarity 100.0%; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                Score 2994; DB 4;
Pred. No. 2.9e-212;
; Mismatches 0;
                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                Gaps
                                                                                                               240
                                                               300
                                                                                                                                         180
                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             360
              360
                                                                                        240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         480
                                                                                                                                                                                                                                                                                                 0;
                                                                            В
                                                                                                                                                  Qy
                                                                                                                                                                                g
                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
Ş
                         밁
                                               δÃ
                                                                                                   Qy
                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
```

```
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377.155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
CORTWARDE: Datestry US 7 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOFTWARE: Pa
SEQ ID NO 15
LENGTH: 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 539; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 15, Application US/09377155 Patent No. 6197312
                                     299
                                                                    289
                                                                                                         241
                                                                                                                                                                                                                 171
                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                      118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
 349
                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                          DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN 420
                                 KGKGENGSSTDEGEGIVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA 348
                                                                                                                                                                                                                                                                    ------SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NVAPGYKEGDYTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMA 540
                                                                                                                                                                                                                                                   KNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD
SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP 408
                                                                                                                                                                              DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 90.0%; Score 2694; DB 4;
89.7%; Pred. No. 3.4e-190;
tive 14; Mismatches 34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540
                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360
```

w ••

```
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-01031
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                     δ.
                                                                                               Вb
                                                                                                                        Q
                                                                                                                                                       Дb
                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 4
US-09-669-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
              Qγ
                                          밁
                                                                   Qy
                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                   ; ORGANISM: Neisseria meningitidis US-09-669-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver.
SEQ ID NO 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 15, Applia Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                           LENGTH: 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            419
                289
                                            241
                                                                                                  181
                                                                                                                              171
                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         599 W 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    359
                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                       _
                                                                                                                                                      Σ
KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                          A--SDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                          TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                               DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                            DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHEGTSASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDKGALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Application US/09669974
                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                      90.0%;
                                                                                                                                                                                                                                                                                                                            14; Mismatches
                                                                                                                                                                                                                                                                                                                                      Score 2694; DB 4;
Pred. No. 3.4e-190;
                                                                                                                                                                                                                                                                                                                                                    Length 599;
                                                                                                                                                                                                                                                                                                                            Indels 14;
                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                   170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   418
                                                                                                                           228
                                                                                                                                                       180
                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    538
                                          298
                                                                      288
                                                                                               240
                                                                                                                                                                                                                                                                                                                            ω
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Бр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                           QΥ
                                                                       밁
                                                                                           δÃ
                                                                                                                    Дb
                                                                                                                                                                   밁
                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Neisseria
US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
δÃ
                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; Sequence 5, Application US/09377155
; Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                             SOFTWARE: Pa
                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION: APPLICANT: PEAK, I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                   TYPE: PRT
 289
                         240
                                                                       180
                                                                                               171
                                                                                                                      120
                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            299
                                                                                                                                                                                                                                                                           y Match 87.4%; Score 2616.5; DB 4; Local Similarity 87.7%; Pred. No. 1.7e-184;
                                                                                                                                                                     60
                                                                                                                                                                                           61
                                                                                                                                                                                                                Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ε
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKLGAKTSVIKEKDGKLVTG
                                                                                  DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA
 KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                         A--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                       DPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         589
                                                                                                                                                                                                                                                                                                                                                                                      PatentIn Ver.
                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                                                                                       2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SURFACE ANTIGEN
                                                                                                                                                                                                                                                                18;
                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                       Length 598;
                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                 15;
                                                                                                                                                                                                                                                                Gaps
  348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    408
                                               288
                                                                                               228
                                                                                                                     179
                                                                                                                                             170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               538
                                                                       239
                                                                                                                                                                                                                                                                 4.
```

```
Q
                                                                          Ъ
                                                                                             Q
                                                                                                                     DЬ
                                                                                                                                         Ş
                                                                                                                                                                рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                        FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US/09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-669-974-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
          Ş
                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 5, Application US/09669974
Patent No. 6333173
                                                                                                                                                                                                           Query Match
Best Local Similarity
Matches 527; Conserv
                                                                                                                                                                                                                                                                                                SEQ ID NO 5
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                  ORGANISM: Neisseria meningitidis - 09-669-974-5
                                                                                                                                                                                                                                                                                                                      NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                        TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 598 W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        298
           229
                                                    171
                                                                           120
                                                                                                 121
                                                                                                                     60
                                                                                                                                           61
                                                                                                                                                                DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                       D-----FTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP 408
                                                                                                                                   ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
           TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                 DPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                           ENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                     EPVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTN 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        589
Conservative
                                                                                                                                                                                                                      87.4%; Score 2616.5; 87.7%; Pred. No. 1.7
                                                                                                                                                                                                             18;
                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                     .5; DB 4;
1.7e-184;
                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                               Length 598;
                                                                                                                                                                                                           15;
                                                                                                                                                                                                           Gaps
                                                     228
                                                                                                170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        357
                                                                           179
                                                                                                                                                                                                             4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
Ş
                     밁
                                        δÃ
                                                                 В
                                                                                    Qy
                                                                                                            밁
                                                                                                                                Qy
                                                                                                                                                        밁
                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뫄
                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              289
 229
                      180
                                           171
                                                                  120
                                                                                       121
                                                                                                            60
                                                                                                                                  61
```

```
RESULT 7
US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                      ; ORGANISM: Neisseria
US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 13, Approximately No. 6197312
                                                                                                                                                                                                                                                                                                                                                       SOFTWARE: |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                            FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                TYPE: PRT
                                                                                                                                                                                                                                                                                                                                            LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   598 W 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          589 W 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240 A--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                   KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA 348
                        ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                 EPVORTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKONTN 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                                                                                              598
                                                                                                                                                                                                                                                                                                                                                                     PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Application US/09377155
                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                    meningitidis
                                                                                                                                                                                                                                                 87.28;
                                                                                                                                                                                                                                     19; Mismatches
                                                                                                                                                                                                                                      Score 2610.5; DB 4;
Pred. No. 4.6e-184;
19; Mismatches 42;
                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                  598;
                                                                                                                                                                                                                                        15;
                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          408
                               239
                                                                              179
                                                                                                        170
                                                                                                                                                                                      59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 417
     288
                                                                                                                                                                                                              60
```

```
В
                                                                                                            Q
                                                                                                                                          밁
                                                                                                                                                                 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 8
US-09-669-974-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                     В
                                                             Q
                                                                                                                                                                                                                                                            ; ORGANISM: Neisseria meningitidis US-09-669-974-13
             Ş
                                                                                                                                                                                             Query Match
Best Local S
Matches 525
                                                                                                                                                                                                                                                                                               SEQ ID NO 13
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 13, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                          CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU9B/01031
PRIOR FILING DATE: 1999-12-14
                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION NUMBER: GB 9
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                      TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                171
                                        120
                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      289
                                                                                        60
                                                                                                                  61
                                                                                                                                           \vdash
                                                                                                                                       DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                     Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQ 588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGASASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                              al Similarity
525; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 598
                                                                                                                                                                                              Conservative
                                                                                                                                                                                                        87.2%; Score 2610.5; DB 4; 87.4%; Pred. No. 4.6e-184;
                                                                                                                                                                                            19;
                                                                                                                                                                                                                                                                                                                                                                 9726398.2
                                                                                                                                                                                              Mismatches
                                                                                                                                                                                            Indels
                                                                                                                                                                                                                     Length
                                                                                                                                                                                            15;
                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          357
                                     179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          417
                                                               170
                                                                                                                                                                                            4.
                                                                                                                                                                                                                                                                                              PRIOR APPLICATION NUMBER: PCT/A
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 97
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 7
                                                Š
                                                                                                                                                                                                                                            ; LENGTH: 594
; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
Ş
                         밁
                                                                           밁
                                                                                                Ş
                                                                                                                            밁
                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                              Query Match
Best Local S
Matches 517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 7, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ALFILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                        CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                          120
                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         598 W 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    529
                                                                                                                                                                              y Match 86.0%;
Local Similarity 86.6%;
nes 517; Conservative 2
                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
 HLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQS
                                                                                                                                                                                                                                                                                                                                                                                                                               NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                            PCT/AU98/01031
                                                                                                                                                                                                                                                                                                                                                     GB 9726398.2
                                                                                                                                                                                 20;
```

```
ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                  ENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTV
                             D-----FTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTV 174
                                                         EPVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTN 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                     Score 2573.5; DB 4;
Pred. No. 2.4e~181;
0; Mismatches 49;
                                                                                                                                       Indels
                                                                                                                                                       Length
                                                                                                                                                          594;
                                                                                                                                       11;
                                                                                                                                      Gaps
                                                                                               59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              357
232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 348
                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         288
```

```
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR PILING DATE: 1999-08-19
PRIOR ETLING DATE: 1999-12-14/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN VET. 2.0
SEQ ID NO 7
SEQ ID NO 7
SEQ ID NO 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                     밁
                                                                                                                               οy
               8
                                            Вb
                                                                    δÃ
                                                                                                                                                                В
                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-669-974-7
                                                                                                                                                                                                           Query Match
Best Local Similarity 86.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 7, Application Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                               TYPE: PRT
ORGANISM: Neisseria
-09-669-974-7
                                                                                                                                                                                                                                                                                                                                          LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       298
                175
                                                                           121
                                                                                                      60
                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANKPVRITNVAPGVKEGDVTNVAQLKGYAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LPGKSMMAIGGDTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
HLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQS
                                                                                                      EPVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTN 119
                                                                                                                                   ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                               meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US/09669974
                                                                                                                                                                                                                      86.0%; Score 2573.5; DB 4;
86.6%; Pred. No. 2.4e-181;
tive 20; Mismatches 49;
                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 297
                                                                                                                                                                                                                           4;
```

```
RESULT 11
US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                    망
                                                                     δõ
                                                                                                           망
                                                                                                                                              δÃ
                                                                                                                                                                                    В
                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                         рь
                                                                                                                                                                                                                                                                                                                                                                                                                         ; ORGANISM: Neisseria
US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: Pa
SEQ ID NO 9
LENGTH: 594
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                Query Match 84.1
Best Local Similarity 85.3
Matches 509; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 9, Application patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1990-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SED ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: PEAK, Ian Richard Anse
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE OF INVENTION: FILE REFERENCE: 06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            298
                                    180
                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHEGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ANKPURITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY 532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--S
                                                                                                                          ---SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTV 174
                                                                                                                                                                                                     ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ---
                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LPGKSMMAIGGDTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
ENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKG
                                                     HLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQS 232
                                                                                                           ENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTV
                                                                                                                                                                                  EPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTN 119
                                    HLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                              meningitidis
                                                                                                                                                                                                                                                                                                                                                    84.1%;
85.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/09377155
                                                                                                                                                                                                                                                                                                                                    19;
                                                                                                                                                                                                                                                                                                                                Score 2516.5; DB 4;
Pred. No. 3.7e-177;
19; Mismatches 58;
                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                      11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  594
                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         417
                                                                                                                 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   352
   292
                                        237
```

4.

Ş

```
GENERAL INFORMATION:

APPLICANT: PEAK, IAN RICHARD ANSELM
APPLICANT: JENNINGS, MICHARD PAUL
APPLICANT: MOXON, E. RICHARD
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                        20
                                                           Ş
                                                                                   В
                                                                                                       δÃ
                                                                                                                                   Ъ
                                                                                                                                                                                  Вb
                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                             ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 12
US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
             Š
                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                             Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                             NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. SEQ ID NO 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 9, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     413
               233
                                      180
                                                              175
                                                                                    120
                                                                                                           118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            238
                                                                                                                                   60
                                                                                                                                                          61
                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKG
                                                HLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQS
                                                                                                                                  EPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTN
                                                                                                                                               ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATYTLKAGDNLKIKQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANKPYRITNVAPGVKEGDYTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY 532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAY 537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                             84.1%;
85.3%;
                                                                                                                                                                                                                                                                                                                                                          2.0
                                                                                                                                                                                                                                  19;
                                                                                                                                                                                                                                Score 2516.5; DB 4;
Pred. No. 3.7e-177;
9; Mismatches 58;
                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                 11;
                                                                                                                                                                                                                                Gaps
                                                                                                         174
                                                                                                                                  119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     472
                                                                                   179
                                   237
                                                           232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           297
             292
                                                                                                                                                                                                                                 4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                             δ
                                                                      밁
                                                                                            δÃ
                                                                                                                     밁
                                                                                                                                           Š
                                                                                                                                                                      Дb
                                                                                                                                                                                         Ş
                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                          õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                        Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                     Matches
                         235
                                                232
                                                                                                                       117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       238
  292
                                                                         177
                                                                                                                                                                       61
                                                                                                                                                                                              61
 GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGN
```

```
RESULT 13
US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; ORGANISM: Neisseria
US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN VET. 2.0
SEQ ID NO 17
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 17, Application Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION NUMBER: PCT, PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity
                                                                                                                                                                                                                                                                                                             MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD 472
                    SENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGK
                                                                                                 VHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQ
                                                                                                                                                                         ESVQRS-VVGSIQASMEGSVELET---ISLSMINDSKEFVDPYIVVILKAGDNLKIKQNT
                                                                                                                                                                                                                                                                      ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHG-ATVTLKAGDNLKIKQ-- 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY 532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNG
SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGK
                                                                         VHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--
                                                                                                                                                      NENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NOVEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                           83.2%; Score 2490.5; DE 85.5%; Pred. No. 3e-175;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US/09377155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PCT/AU98/01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                          18; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                               DB 4;
                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                               Length 592;
                                                                                                                                                                                                                                                                                                                                                                                          15;
                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             417
                                    291
                                                                                                                                                      176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          357
                                                                                                                                                                                             173
                                                                                                                                                                                                                                    116
                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               352
294
                                                                             234
                                                                                                                                                                                                                                                                                                                                                                                        6;
```

```
Q
                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                          Вρ
                                                                                                                                                                                                                                                                        Qy
                                                                            Q
                                                                                                             В
                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                        QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 14
US-09-669-974-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                Ş
                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; ORGANISM: Neisseria meningitidis US-09-669-974-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                             Query Matcn
Best Local Similarity
Matches 511; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 17, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LENGTH: 59
TYPE: PRT
                                                                                                               177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      355
                  292
                                                 235
                                                                              232
                                                                                                                                                                              117
                                                                                                                                                                                                           118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     295
                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                          \vdash
                                                                                                                                                                                                                                                                                                                          1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL 60
                                            VHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KMDETVNINAGNNIEITRNGKNIDIATSMTPQESSVSLGAGADAPTLSVDDEGALNVGSK 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNRIDNYNGNARAGIAQAIATAGLAQA 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTTATYSKDDQGNITYKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG 411
              GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGN
                                                                                                             VHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--
                                                                                                                                                                             NENTNASSETYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTT
                                                                                                                                                                                                                                                                        ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHG-ATVTLKAGDNLKIKQ--
                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQA 534
                                                                                                                                                                                                                                         ESVQRS-VVGSIQASMEGSVELET---ISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNT 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
592
                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                   83.2%;
85.5%;
                                                                                                                                                                                                                                                                                                                                                                         18;
                                                                                                                                                                                                                                                                                                                                                                  Score 2490.5; DB 4;
Pred. No. 3e-175;
Pred. No. 3e-175;
                                                                                                                                                                                                                                                                                                                                                                                                     DB 4;
                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                      15;
                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                            291
                                                                                                                                           231
                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                             176
                                                                                                                                                                                                                                                                        117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   354
                  351
                                                                                                             234
                                                                                                                                                                                                                                                                                                                                                                       6
```

```
δÃ
                                DЪ
                                                           Qy
                                                                                               밁
                                                                                                                            Qy
                                                                                                                                                               밁
                                                                                                                                                                                            δÕ
                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; ORGANISM: Neisseria meningitidis US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뭥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQ ID NO 21
LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 21, Application Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                               Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: PEAK, Ian Richard Anse
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE: PRT
                                297
                                                                                                237
                                                                                                                                                               179
                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        352
354
                                                              294
                                                                                                                               234
                                                                                                                                                                                                                                                              116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         295
                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                               1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEE-
                                                                                                                                                            KOSGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVH 175
TATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                              NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT
                                                                                               NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGE
                                                                                                                                                                                                                                                                                               YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSD--WAVYFNEKGVLTAREITLKAGDNLKI 118
                                                                                                                                                                                                                                                                                                                            -LESVARSALVLQFMIDKEGNGE---IESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKI 115
                                                                                                                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        YLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNRIDNYNGNARAGIAQAIATAGLAQA 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTTATVSKDDQGN1TVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV1SGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGN
                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ω
S
                                                                                                                                                                                                                                                                                                                                                                                                                                            82.8%; Score 2479; DB 4;
84.2%; Pred. No. 2.1e-174;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US/09377155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                28; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                Indels 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                              353
                                                                                                296
                                                                                                                               293
                                                                                                                                                               236
                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         354
                                                                                                                                                                                                                                                                                                                                                                                                59
```

Search completed: July 3, 2002, 08:10:15 Job time: 527 sec

THIS PAGE BLANK (USPTO)

```
Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŏ
      Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
2626.5

2676.5

2676.5

2676.5

423

358

358

358

357.5

257.5

257.5

257.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

225.5

226.5

227.5

227.5

227.5

227.5

227.5

227.5

227.5

227.5

227.5

227.5

227.5

227.5

227.5

227.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query
      887.7
200.111.13.3
112.0
1111.18.6
1111.18.6
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1111.18.7
1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        July 3, 2002, 08:12:05; Search time 95.27 Seconds (without alignments) 594.065 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PIR_71:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            283138 seqs, 96089334 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-771-382-3
2994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVVVS.....TASGNSRGHFGTSASVGYQW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             pir1:*
pir2:*
pir3:*
pir4:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
   298
2059
1190
11588
11588
1107
658
11107
658
11101
1325
1417
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
11314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
                                                                                               A83080
H83135
E908133
B85547
F90696
F90696
AP60803
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A81888
G81133
G81133
D82615
A82615
A86036
H91188
AC0976
AH0110
C82672
A64905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ID
                                                                 AB2445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                         hypothetical prote
hypothetical prote
S-layer protein -
hemolysin A - Serr
                                                                                                                                                                                                                                                                                           hypothetical prote
hypothetical prote
probable adhesin-lik
AidA-I adhesin-lik
probable adhesin Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        adhesin homolog HI
surface protein XF
surface protein XF
probable adhesin Z
probable adhesin E
probable autotrans
probable surface p
                              high-molecular-wei
adhesin AIDA-I pre
hypothetical prote
probable autotrans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ydeK protein - Esc
hypothetical prote
probable adhesin F
                                                                                                                                                                                                                                                                                                                                                                                                                                                            hypothetical prote
probable RTX famil
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ydeK protein - Eso
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 adhesin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            probable surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NMB0992
```

## ALIGNMENTS

RESULT A81888

ns e	rr re		-6616	המספים	រ អ ជ	XE XE	Z m. 1			
te Qy 354 TATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM 413 ns	Oy 294 NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT	IK QY 234 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGE	174 VHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSE	OG Qy 118SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPT  Ce :	Qy 61 ESVARSALVLQEMIDKEGNGEIESTGDIGWSİYYDDHNTLHG-ATVTLKAGDNLKIKQ 117 ns	Qy 1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL 60 XF	Query Match 87.7%; Score 2626.5; Best Local Similarity 89.1%; Pred. No. 1.5e Matches 531; Conservative 13; Mismatches	A; Accession: Adjusts A; Status: preliminary A; Status: preliminary A; Molecule type: DNA A; Residues: 1-592 < PAR> A; Cross-references: GB: AL162755; GB: AL157959; NID: g7379742; PIDN: CAB84461.1; PID: g737 A; Experimental source: serogroup A, Strain Z2491 C; Genetics: A; Gene: NMA1200	Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quail, M.A.; Rajandre Nature 404, 502-506, 2000  A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis 22491  A;Reference number: A81775; MUID:20222556	A81888  Probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis (strain Z C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001 C;Accession: A81888 C;Accession: A81888 R;Parkhill, J; Achtman, M.; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, S.R.; Mo
KAVAGSSGKVISGNVSPSKGKM 413                      KAVAGSSGKVISGNVSPSKGKM 416	QADKFETVTSGTKVTFASGNGT 353 	GAKTSVIKEKDGKLVTGKGKGE 293 	DVLNAGWNIKGVKTGSTTGQSE 233 	ITSDTKGLNFAKETAGTNGDPT 173                      IISDTKGLNFAKETAGTNGDTT 176	TLHG-ATVTLKAGDNLKIKO 117 : :TVDDYIVVTLKAGDNLKIKONT 116	LATLLSATVQANATDTDEDEEL 60                   :   LATLLFATVQANATDEDEBEL 60	DB 2; Length 592; -128; 41; Indels 11; Gaps 4;	D:g7379742; PIDN:CAB84461.1; PID:g737	strain of Neisseria menigitidis 22491	<pre>d] - Neisseria meningitidis (strain Z 00 #text_change 02-Feb-2001 v. S.D.: Churcher, C.: Klee, S.R.; Mo</pre>

```
adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B)
C;Species: Neisseria meningitidis
C;Species: Neisseria meningitidis
C;Date: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001
C;Accession: G811133
R;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, J.;
Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B.A.
ri, H.; Oin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M.
Science 287, 1809-1815, 2000
A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; V.
A;Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; NEGLUS, PACALUMA
A; Molecule type: DNA
A; Residues: 1-591 <TET>
A; Cross-references: GB: AE002450; GB: AE002098; NID: g7226229; PIDN: AAF41395.1; PID: g722623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
G81133
                                                                                                                   δÃ
                                                                                                                                                             Дb
                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Experimental source: serogroup C; Genetics: A; Gene: NMB0992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                     δõ
                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Reference number: A81000; MUID:20175755
A;Accession: G81133
A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
  417
                                                                                                                       354
                                                                                                                                                                 297
                                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                       234
                                                                                                                                                                                                                                                                                                                                                                    176
                                                                                                                                                                                                                                                                                                                                                                                                          119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        417
                                                                                 357
                                                                                                                                                                                                       294
                                                                                                                                                                                                                                                                                                                                                                                                                                                  116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ب
                                                                                                    TATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA 473
                    DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
                                                                                                                                                                                    | NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT
                                                                                                                                                                                                                                                               NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGE
                                                                                                                                                                                                                                                                                                                          LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--SD
                                                                                                                                                                                                                                                                                                                                               LNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQSE
                                                                                                                                                                                                                                                                                                                                                                                                          KQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSD--WAVYFNEKGVLTAREITLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                 TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                           NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKKD
                                                                                                                                                               NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                  KQSGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -LESVARSALVLQFMIDKEGNGE---IESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKI 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        82.8%;
84.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 2479; DB 2;
Pred. No. 6.4e-121;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         592
                                                                                                                     413
                                                                                                                                                                                                                                                                                                                                                                                                                                                  175
                                                                                                                                                                                                     353
                                                                                                                                                                                                                                           296
                                                                                                                                                                                                                                                                                  293
                                                                                                                                                                                                                                                                                                                            236
                                                                                                                                                                                                                                                                                                                                                                  233
                                                                                                                                                                                                                                                                                                                                                                                                          178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      476
                                                                                                                                                               356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6
```

•

A; Title: The genome sequence of the plant A; Reference number: A82515; MUID: 20365717

of authors

see

reference number

pathogen

xylella

fastidiosa A59328 below

R; anonymous, The Xyle Nature 406, 151-157, C; Accession: D82671

The Xylella

fastidiosa Consortium of

the Organization for

Nucleotide

2000

A; Molecule type: DNA A; Residues: 1-2059 < A; Status: preliminary A; Note: for a complete list A; Accession: D82671 surface protein XF1529 [imported] - Xylella fastidiosa (strain 9a5c)
C;Species: Xylella fastidiosa
C;Date: 18-Aug-2000 #sequence\_revision 20-Aug-2000 #text\_change 20-Aug-2000

```
adhesin homolog HI1732 - Haemophilus influenzae (strain Rd KW20)
C;Species: Haemophilus influenzae
C;Species: Haemophilus influenzae
C;Species: Haemophilus influenzae
C;Date: 18*Aug-1995 **sequence_revision 18*Aug-1995 **text_change 24*Oct-1997
C;Accession: I64138
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.;
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.;
Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.
D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghage
Science 269, 496-512, 1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae FA;Reference number: A64000; MUID:95350630 A;Recession: I64138 A;Status: nucleic acid sequence not shown; translation not shown
                                                                           밁
                                                                                                              Qγ
                                                                                                                                                      밁
                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Molecule type: DNA
A; Residues: 1-298 <TIGR>
A; Cross-references: GB:U32846;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
270
                                    283
                                                                           212
                                                                                                                                                         155
                                                                                                                                                                                           164
                                                                                                                                                                                                                                                                         113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      474
                                                                                                                                                                                                                                  95
                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                    53
                                                                                                                                                      ---GINGDTAVHLNGLASTLPDVTTNTGASTSVTFSPSDIEKTRAATIKDVLNAGWNIKG
                                                                                                                                                                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQA-----NAT
GKLLTGKQLKDANTGTATNATEDTDE
                                    GKLYTGK-----
                                                                                                                                                                           ETAGTNGDPTVHLNGIGSTLTDTLAGSSAS-HVDAGNQSTHYTRAASIKDVLNAGWNIKG
                                                                                                                                                                                                                                  LKAKLDQGGKSVTFALAKDLDVKTAKVSDTLTIGGNTPAAGGATPKVSITSTADGLKLAK
                                                                                                                                                                                                                                                                                                                STEDDIE-DSAATK-----DDNKNQALKA----
                                                                                                                                                                                                                                                                                                                                                    DTDEDEELESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDN 112
                                                                                                                                                                                                                                                                                                                                                                                             MNKIFKVIWNVVTQTWVVVSELTRAHTKRTSATVATAVLATVLSATVQAINDAGTFVKVQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYL 533
                                                                                                                                                                                                                                                                       LKIK--QSGKDFTYSLKKELKDLTSVETEKLSFGAN-----GNKVNITSDTKGLNFAK
                                                                           AKVAG -- GNTENVDLVAGYDNVEFITGDKNTLDVVLTAKENGKTTEVKFTPKTSVIKDNN
                                                                                                                  VKTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                  -GKGENGS-STDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GB:L42023;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       32; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 600.5;
Pred. No. 3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NID: g1574588;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ); DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2;
                                                                                                                                                                                                                                                                                                             -----GDTLTLKAGKN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PID:g1574589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Geoghagen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TIGR:HI1732
                                                                                                                  282
                                                                                                                                                                                                                                  154
                                                                                                                                                                                                                                                                         163
                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                94
                                                                           269
                                                                                                                                                         211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      J.M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Kerlavage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N.S.
```

```
submitted to GenBank, June 2000
A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frobu A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigr J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigr Chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, E.A.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.F. Fodriques, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A;Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silvei, A.A.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; Z.M.; Silva, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; Z.M.; Silva, A.M.; Silva, S.; Vettore, A.L.; Z.M.; Silva, 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Reference number: A59328
A;Contents: annotation
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: GB:AE003982; GB:AE003849; NID:g9106554; PIDN:AAF84338.1; GSPDB:GN0 A;Experimental source: strain 9A5c R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S. submitted for General Transports.
                                                                          Ş
                                                                                                                                                                           В
                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 173; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1571
2025 GVSAVSESGHWVFKFSGSANTRSHVGVGAGVGYQW 2059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VQNNTVGTVSVGDAAKGETRSISNVADAKEAMDAVNLRQLDAVAQKSNLQTDDMRHEINN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EETDAVNFSQL-----KSISTAVDQGWTLTASGANGSKVASGGTVDLKNTDGNL 1450
                                                                                                                                                                                                                              GVAQNLNNRIDNVNGNAR----AGIAQAIATAGLAQAYLPGKSMMAIGGGTYLGEAGYAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TISKSGDSNDVVFNLSEDLKEKSITVGNTQLDKDGVKVSSNVLLDSNELVITSHSSTSSV 1510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KIKQSG--KDFTYSLKKELKDL-----TSVETEKLSFGAN----GNKVNITSDT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VEFLSADTK----TTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGEN--
                                                                                                                                                                           QGLITAKQYTDGMVGNLRRETSGGVAAAIATANLPQAYVQGRGMTSVGVSSYQGQSAIAV
                                                                                                                                                                                                                                                                                                                                                                                                                                          SMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLK 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IEDVFKITKGDSASSVKG------MGVNAMAIGTNAAVSGTESVALGKNTNVSA 1916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----KAVAGSSGKVISGNVSPSKGKMDETVNINA---GNNIEITRN-----GKNIDIAT 438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTQASGEGAAAVGSGAAASGKGSTAIGRNAIASADGSVALGDGAKDGGRGAESYTGKYSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SHVAVGMADTDAVNVSQLKQAVQSVTVKATRYYSTNDGGTQGGNYDGDGATGSKAIAAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VFNLSKDFKVDEVTAGNTVVNTDGVKVG--SDVSLGAMGLFIANGPSVTASGFNAGDKVI 1688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EDTDAVNFSQLKSVSEAVDKGWTLTASGANGSKVVSGGTVDLKNTDGNLAISKSGDSNDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QST---HYTRAASIKDVLNAGWNIKGV-KTGSTTGQSENVDFVRT------YDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KTLANGESVVNRTVVNGDGVNIDDVVVVNDLGLSIVGGASLTLSGINAGSHKITNVTAGT 1570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EELESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHN---TLHGATVTLKAGD-NL 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----GSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTG-----QADKFETVTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----KGLNFAKETA----GTNGDPTVHLNGIGSTLTD----TLAGSSA-----SHVDAGN 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14.1%; Score 423; DB 2; Length 2059; ilarity 24.9%; Pred. No. 5.9e-14; Conservative 97; Mismatches 225; Indels 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -FASGNGTT----ATVSKD----
                                                                                                                                                                                                                                                                                                                                                      -DRANSVSVGSGGSER - - QVTNVAAGTADTDAVNVSQLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----DALNVNQL----QNSGWNLDS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----DQG----NITVKYD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels 200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSPDB:GN00
```

```
R.Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R. Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S. submitted to GenBank, June 2000

A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajina, J.P.; Krieger, J.E.; Kuramae, E.E.; La chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins A; Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C., F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, Rodriques, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L., A; Reference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;MoLecule type: DNA
A;Residues: 1-1190 <SIM>
A;Residues: 1-1190 <SIM>
A;Cross-references: GB:AE004017; GB:AE003849; NID:g9107083; PIDN:AAF84783.1;
A;Experimental source: strain 9a5c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Title: The genome sequence of the plant pathogen Xylella fastidiosa. A;Reference number: A82515; MUID:20365717
A;Note: for a complete list of authors see reference number A59328 below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              surface protein XF1981 [imported] - Xylella fastidiosa (strain 9a5c)
C;Species: Xylella fastidiosa
C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-
                                                     Š
                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R; anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C; Accession: A82615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Contents: annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Accession: A82615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 162
                                                                                                                                                           1007
                                                                467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            767
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                XF1981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SSLK-----LDKLTVG-----DTVMTTNGV----TVGSG----VTLGSMGLVITD--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IDKEGNGEIESTGDIGWSIY---YDDHNTLHGATVTLKAGD-NLKI-KQSG-KDFTYSLK 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NVTLGSTGLVITDGPSVTSSGISAGNQKITNVAAGTADTDAVNFSQLQAVS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NHTKRASATVAT---AVLATLLSA-----TVQANATDTD--EDEELESVARSALVLQFM 73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NITVKYDVNVGDALNVNQL----QNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNI 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AVASADGSVALGD-GAKDGARGAESYTGKYSGLQNNTVGTVSVGDASKGETRTVS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----GGTQGGNYNGDGATGTRSIAVGVGTLASA----EGATAVGSGAAASGKGSTAIGRN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENG-SSTDEGEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -GPSVTSSGINAGSQKITNVAAGTADTDAV----NLSQLNTAMAGSGAKSVHYYSTYD--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AGSS--ASHVDAGNQS-THYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRTYDTV 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIGSTLTDTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -STASKGWNLLASGANSSNVAPGESVDLKNTDGNIVISKESGSNDVLFNLS
NVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNAR
                                                                                                                                                                SATPIAAGVDATAIGVGATASGADSIAMGNKASASADNAVAIGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13.3%; Score 399; DB 2; 26.3%; Pred. No. 5e-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 1190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels 144;
                                                                                                                                                                                                                                                                                                                                                                       ----VKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSPDB:GN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Seq
```

```
probable adhesin Z5029 [imported] - Escherichia coli (strain O157:H7, substr C;Species: Escherichia coli (c;Species: Escherichia coli (c;Species: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001 C;Accession: A86036 R;Perna, N.T.; Plunkett III, G.; Burland, V.; Mau, B.; Glasner, J.D.; Rose, iller, L.; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis, Nature 409, 529-533, 2001 A;Title: Genome sequence of enterohemorrhagic Escherichia coli O157:H7. A;Reference number: A85480; MUID:21074935; PMID:11206551
                    QΥ
                                                                                                                 δõ
                                                                                                                                                                       밁
                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                  QY
                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                    Оy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Molecule type: DNA
A;Residues: 1-1588 <STO>
A;Cross-references: GB:AE005174; NID:g12518349; PIDN:AAG58749.1; GSPDB:GN00145; UWGP:Z50
A;Experimental source: strain O157:H7, substrain EDL933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Accession: A86036
ſ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1114
                                                                          1239 IGSNAQVIHVNSIAIGNGSTTTRGAQTNYTAYNMDAPQNSVGEFSVGSADGQRQIT---N 1295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1056 HSVADRANTVSVGSAGSER--QVTNVAAGTADTDAVNVSQLNQGLITAKQYTDGVVGSLR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          784 LLWDA----TAGKFSAKHGTNGDASVITDV----ADGEISDSSSDAVNGSQLHGVS-- 831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match 12.0%; Score 358; DB 2; Local Similarity 21.6%; Pred. No. 9.6e-11; ses 180; Conservative 106; Mismatches 268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7 IIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEELESVARS 66
                                                                                                                                                                                                                                                                                                                                                                                                                         TYDT-VEFLSADTK---TTTVNVESKDNGKR-----TEVKIGAK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TNVANG--SISEDSTDAVNGSQLNATNMMIEQNTQIINQLAGNTDATYIQENGAGINYVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KDVLNAGWNIKGVKTGSTTGQSEN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ANTRSQVGIGAGVGYQW 1190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GNSRGHFGTSASVGYQW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RDTDGGVAAAIATANLPQAYIPGRGMTSVGVSSYRGQSAIAVGVSSVSESGRWVFKFSGS 1173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----AGIAQAIATAGLAQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTAS
                                                                                                                                                                          IGAVATTPTKYFHANSTEEDSLAVGTDSLAMGAKTIVNGDKGIGIGYGAYVDANALNGIA
                                                                                                                                                                                                                                                                         KGSRDTSITENGVVIGYDTTDGELLGALSIGDDGKYRQIINVADGSEAHDAVTVRQLQNA
                                                                                                                                                                                                                                                                                                                          ----TSVIKE-----KDGKLYTGKGKGENG-----SSTDEGEGLVTAKEVIDA 313
                                                                                                                                                                                                                                                                                                                                                                           TNDDGLAFNDASAQGVGATAIGYNSVAKGDSSVAIGQGSYSDVDTGIALGSSSVSSRVIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AKETAGTNGDPT-----VHLNGIGSTLTDTLAGSSASHVDAGN-----QSTHYTRAASI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNLKIKQS-GKDFTYSLKKELKDLTSVETEKLSFGA----NGNKVNIT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EVNADGTITAPTYTIANAEYNNVGDAL-DALDDNALLWDETANGGAGAYNASHDGKASII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENGAFSAAHGKDKTASV-----ITNVANGAISAASSDAINGSQLYTTNKYIADALGGDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----SYVVDALGGGAEVNADGTITAPTYTIANADYDNVGDALNAIDTTLDDALLWDADAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ALVLQFMIDKEGNG-EIESTGDIGWSIY-----YDD-HNTLHGATVTL------KAG
                                                                                                                                                                                                                        -- KAGWRMKTTTANGQTGQADKFETVTSGTK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels 280;
                                                                                                                         VSKDDQGNITVKYD 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -VDFVR 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     substrain
                                                                                                                                                                                                                                                                         1178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          572
                                                                                                                                                                                                                                                                                                                                                                           1118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            М.; Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Apodaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EDL933)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mayhe
```

```
R;Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; gasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; DNA Res. 8, 11-22, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        probable adhesin ECs4480 [similarity] - Escherichia coli (strain 0157:H7, s
C;Species: Escherichia coli
C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 02-Nov-2001
C;Accession: H91188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                    δÃ
                                                                                                                                                                                        В
                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Molecule type: DNA
A;Residues: 1-1588 <HAY>
A;Cross-references: GB:BA000007; PIDN:BAB37903.1; PID:913363955; GSPDB:GN00154
A;Experimental source: strain O157:H7, substrain RIMD 0509952
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 A;Reference number: A99629; MUID:21156231; PMID:11258796 A;Accession: H91188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1119
                                                                                                                                                                                        1001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1296 VAAGSADTDAVNVGQLKVTDAQVSQNTQSITNLDNRVTNLDSRVTNIENGIGDIVTTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              487
                                                                                                                                                                                                                                                                                                                                                                                  888
                                                                                                                                                                                                                                         211
                                                                                                                                                                                                                                                                                                                                    162
                                                                                                                                                                                                                                                                                                                                                                                                                              111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          784 LLWDA----TAGKFSAKHGTNGDASVITDV----ADGEISDSSSDAVNGSQLHGVS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Sir
hes 180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7 IIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEELESVARS 66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ECs4480
KGSRDTSITENGVVIGYDTTDGELLGALSIGDDGKYRQIINVADGSEAHDAVTVRQLQNA 1178
                                                                                          INDDGLAFNDASAQGVGATAIGYNSVAKGDSSVAIGQGSYSDVDTGIALGSSSVSSRVIA 1118
                                                                                                                                                                                        TNVANG--SISEDSTDAVNGSQLNATNMMIEQNTQIINQLAGNTDATYIQENGAGINYVR 1058
                                                                                                                                                                                                                                                                                       EVNADGTITAPTYTTANAEYNNVGDAL-DALDDNALLWDETANGGAGAYNASHDGKASII 1000
                                                                                                                                                                                                                                                                                                                                                                                                             DNLKIKQS-GKDFTYSLKKELKDLTSVETEKLSFGA----NGNKVNIT----SDTKGLNF 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---SYVVDALGGGAEVNADGTITAPTYTIANADYDNVGDALNAIDTTLDDALLWDADAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHEGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NNNDVVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KEGDVTNVAQLKGVAQ------NLNNRIDNVNGNARAGIAQAIATAGLAQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVAAGKNATDAVNVAQLKSSEAGGVRYDTKADGSIDYSNITLGGGNGG-TTRISNVSAGV 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N---GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGV 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KYFKTNTDGVDASAQGKDSVAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRIT
                                                                                                                                                                                                                                         KDVLNAGWNIKGVKTGSTTGQSEN-----
                                                                                                                                                                                                                                                                                                                                                                                  ENGAFSAAHGKDKTASV-----ITNVANGAISAASSDAINGSQLYTTNKYIADALGGDA 941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALVLQFMIDKEGNG-EIESTGDIGWSIY-----YDD-HNTLHGATVTL-----KAG 110
                                                                                                                                                                                                                                                                                                                                    AKETAGTNGDPT-----VHLNGIGSTLTDTLAGSSASHVDAGN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                              -TSVIKE-----KDGKLVTGKGKGENG-----SSTDEGEGLVTAKEVIDA 313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----AVAGSSGKVISGNVSPSKG----KMDETVNINAGNNIEITR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12.0%; Score 358; DB 2; 21.6%; Pred. No. 9.6e-11; tive 106; Mismatches 268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 1588,
                                                                                                                                              -TEVKIGAK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (strain O157:H7, substrain
                                                                                                                                                                                                                                           ----VDFVR
                                                                                                                                                                                                                                                                                                                                    -QSTHYTRAASI 210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; Yokoyama,
Shinagawa,
                                                                                                                                                                                                                                           239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          831
                                                                                                                                              274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     33;
```

and g

```
th, T.; Connet Con., ..., S.; Moule, S.; O'Gaora, P.
S.; Moule, S.; O'Gaora, P.
Nature 413, 848-852, 2001
A;Authors: Parry, C.; Quail, M.; Rutherford, K.; Simm A;Title: Complete genome sequence of a multiple drug
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        probable autotransporter sapB [imported] - Salmonella enterica subsp. enterica C;Species: Salmonella enterica subsp. enterica serovar Typhi A;Note: this species has also been called Salmonella typhi C;Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change 09-Nov-2001 C;Accession: AC0976 R;Parkhill, J.; Dougan, G.; James, K.D.; Thomson, N.R.; Pickard, D.; Wain, J.; th, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N.
                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Cross-references: GB:AL513382;
C;Genetics:
A;Gene: sapB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                               밁
                                                                                                                                                δÃ
                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Molecule type: DNA
A; Residues: 1-1107 < PAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
 Ş
                                     망
                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 174; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    371
   190
                                       446
                                                                            151
                                                                                                                 386
                                                                                                                                                    117
                                                                                                                                                                                         326
                                                                                                                                                                                                                                                                   273
                                                                                                                                                                                                                              84
                                                                                                                                                                                                                                                                                                      27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ASMASIGGGTYNGESAVALGVSMVSANGRWVYKLQGSTNSQGEYSAALGAGIQW 1588
SSASHVDAG-NQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRTYDTVEFLS
                                     KITNVAAGALSEDSTDAVNGSQLYETNQKVDQNTSAIADINTSITNLGTDALSWDDEEGA
                                                                          NITSDTKGLNFAKETAGTNGDPTVHLN----
                                                                                                                                                                                     SITNLSSDNLSWNETTNSFSASHGSSTTNKITNVAAGELSEESTDAVNGSQLFETNEKVD
                                                                                                                                                                                                                                                               TFSASRNGSASKITNLAAGTLAADSTDAVNGSQLYETNQK-----VDQNTSAIADINT 325
                                                                                                                                                                                                                                                                                                    TKRASATVATAVLATLLSATVQANATDTDEDEELESVARSALVLQFMIDKEGNGEIE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYOW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NNNDYVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KEGDVTNVAQLKGVAQ------NLNNRIDNVNGNARAGIAQAIATAGLAQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NVAAGKNATDAVNVAQLKSSEAGGVRYDTKADGSIDYSNITLGGGNGG-TTRISNVSAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N---GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KYFKTNTDGVDASAQGKDSVAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VAAGSADTDAVNVGQLKVTDAQVSQNTQSITNLDNRVTNLDSRVTNIENGIGDIVTTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VNVG----DALNVNQLQ------NSGWNLDSK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VN----
                                                                                                               QNTTDIAANTTNITQNSTAIENLNTSVSDINTSITGLTDNALLWDEDTGAFSANHGGSTS
                                                                                                                                                  QSGKDFTYSLKKELKDLTSVETEKLS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IGAVATTPTKYFHANSTEEDSLAVGTDSLAMGAKTIVNGDKGIGIGYGAYVDANALNGIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IGSNAQVIHVNSIAIGNGSTTTRGAQTNYTAYNMDAPQNSVGEFSVGSADGQRQIT---N 1295
                                                                                                                                                                                                                            -STGDIGWSIYYDDHNTLHGATVTLK----AGD----
                                                                                                                                                                                                                                                                                                                                       11.8%;
llarity 20.3%;
Conservative 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----KAGWRMKTTTANGQTGQADKFETVTSGTK--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -VTFASGNGTTAT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ---AVAGSSGKVISGNVSPSKG----KMDETVNINAGNNIEITR
                                                                                                                                                                                                                                                                                                                                       %; Score 352; DB 2;
%; Pred. No. 1.2e-10;
111; Mismatches 256;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PIDN:CAD03303.1; PID:g16504923; GSPDB:GN00176
                                                                          -GIGSTLT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Simmonds, M.;
drug resistant
                                                                                                                                                                                                                                                                                                                                                                          Length 1107;
                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -VSKDDQGNITVKYD
                                                                                                                                                  ----FGAN--GNKV
                                                                                                                                                                                                                            ----NLKIK 116
                                                                                                                                                                                                                                                                                                                                         316;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Skelton, J.;
Salmonella e
                                                                          DTLAG
                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Wain, J.; Churcher; White, N.; Farrar
                                                                                                               445
                                                                                                                                                  150
                                                                                                                                                                                       385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1238
 248
                                     505
                                                                                                                                                                                                                                                                                                    83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     344
                                                                          189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     enterica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Stevens,
                                                                                                                                                                                                                                                                                                                                         29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               serovar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sero
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ×
```

```
probable surface protein (partial) YPO0902 [imported] - Yersinia pestis (strain C; Species: Yersinia pestis C; Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                      ρ
                                                                                                                                                                                           ₽
                                                                                                                                                                                                                      Q
                                                       AH0110
                                                                                                                       В
                                                                                                                           1091
                                                                                                                                                                                             1031
                                                                                                                                                                                                                               513
                                                                                                                                                                                                                                                                                                   499
                                                                                                                                                                                                                                                                                                                                   913
                                                                                                                                                                                                                                                                                                                                                                     458
                                                                                                                                                                                                                                                                                                                                                                                                                                       435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               678
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        506
                                                                       ø
                                                                                                                       SNSQGDYSAAIGAGFQW 1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GDTSETYITENGTGVKYIRTNDNGLEGQDAYATGNGATAVGYDAVASGAGCLALGQNSSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FSASHGTSGTNKITNVAAGEIASDSTDA---INGSQLYET-----NMLISQYNESISQLA
                                                                                                                                                         GNSRGHFGTSASVGYQW 589
                                                                                                                                                                                             NKMSGGIASAMAMAGLPQAYAPGANMTSIAGGTFNGESAVAIGVSMVSESGGWVYKLQGT
                                                                                                                                                                                                                           GNARAGIAQAIATAGLAQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IVNADAGIGIGLNTLVMADAINGIAIGSNARANHANSIAMGNGSQTTRGAQTDYTAYNMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TVKYDVNVGDALNVNQLQN--SGWNLDSKAVAGSSGKVISGNVSP--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NVADGSEAQDAVTVRQLQNAIGAVTTTPTKYYHANSTEEDSLAVGTDSLAMGAK-----T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TTANGQTGQ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIEGSTALGSGSTSNRAITTGIRETSATSDGVVIGYNTTDRELLGALSLGTDGESYRQIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TDEG----
                                                                                                                                                                                                                                                               YSVLNLGDGSGGTTRIGNVSAAVNDTDAVNYAQLKRSVEEANTYTDQKMGEMNSKIKGIE 1030
                                                                                                                                                                                                                                                                                                                                 NSVADEANTVSVGSSTQQR--RITNVAAGVNNTDAVNVAQLKASEAGSVRYETNADGSVN 970
                                                                                                                                                                                                                                                                                                                                                                   LSVDDE-GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLK-----
                                                                                                                                                                                                                                                                                                                                                                                                   NLDTRVTNIENGIGDIVTTGSTKYFKTNTDGADANAQGADSVAIGSGSIAAAENSVALGT 912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TPQNSVGEFSVGSEDGQRQITNVAAGSADTDAVNVGQLKVTDAQVSRNTQSITNLNTQVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----SKGKMD---ETVNINAGN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADTKTTTVN-----VESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKG---KGENGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                       -----DIATSMTPQF-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----EGLV----TAKEVIDAVNKA----GWRMKT 323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ---ADKFETVTSGTKVTFASGNGTTATVSKDDQGNI 365
                                                                                                                                                                                                                                                                                                 ---GVAQ----
                                                                                                                                                                                                                                                                                                                                                                                                                                       -----SSVSLGAGADAP-----T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---NIEITRNGKNI--
                                                                                                                                                                                                                                                                                                   NLNNRIDNVN 512
                                                                                                                                                                                                                                                                                                                                                                                                                                         457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         852
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     617
                                                                                                                                                                                                                               572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       297
                                                                                                                                                                                                                                                                                                                                                                     498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               732
```

C;Accession: AH0110

R;ParKhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, il, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barro, Nature 413, 523-527, 2001 Ş A;Cross-references: C;Genetics: A;Gene: YPO0902 В A; Molecule type: D A; Residues: 1-658 A; Status: preliminary A; Reference number: A; Accession: AH0110 A;Title: Genome sequence of Yersinia pestis, the causative agent A;Reference number: AB0001; MUID:21470413; PMID:11586360 Query Match Best Local S Matches 154 105 27 TNLAPATISSTSTDAVVGSQLYNLVQDGTRYFHANSVNPTDSLASGLETIA-TKRASATVAT ---- AVLATLISATVQ------ ANATDTDED--EELESVARSALVLQFM 73 Similarity Conservative <KUR> GB:AL590842; PIDN:CAC89747.1; 11.1%; 23.9%; ; 08 Score 332.5; | Pred. No. 6.3e 80; Mismatches e 332.5; Db z,
1. No. 6.3e-10;
----hes 239; PID:g15978974; GSPDB:GN00175 Indels Length 171; of plague Gaps 26; C092)

വജ

```
A; Molecule type: DNA
A; Rosidues: 1-1004 <SIM>
A; Rosidues: 1-1004 <SIM
Billones: A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; Agrical 
Briones, M. R. S.; Bueno, M. R. P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, F.
Briones, M. R. Suenco, M. C.; Forro, J. A.; Fracincani, A.P.; Ferralra, A.J.S.
Submitted to GenBank, June 2000
A; Authors: Ferreira, V.C.A.; Ferro, J. A.; Fraga, J. S.; Franca, S. C.; Franco, M. C.; Frohn
J. D.; Junqueira, M. L.; Kemper, E.L.; Kitajima, J. P.; Krieger, J. E.; Kuzamae, E. E.; Laigr
Chado, M. A.; Madeira, A. M. B. N.; Madeira, H. M. F.; Marino, C. L.; Marques, M. V.; Martins, F.
A; Authors: Martins, E.M. F.; Matsukuma, A. Y.; Menck, C. F. M.; Miracca, E. C.; Myaki, C. Y.;
F. G.; Nunes, L. R.; Oliveira, M. A.; de Oliveira, M. C.; de Oliveira, R. C.; Palmieri, D. V.
F. G.; Nunes, V.; Rosa, A.J. de M.; de Rosa Jr., V. E.; de Sa, R. G.; Santelli, R. V.; Sawasal
A; Authors: da Silva, A. C. R.; da Silva, F. R.; da Silva, A. M.; Silva Jr., W. A.; da Silvai, M. B.; Tsuhako, M. H.; Vallada, H.; Van Sluys, M. A.; Verjovski-Almeida, S.; Vettore, A. L.; J.
F. F. S. Santelli, R. V.; Sawasal
M.; Tsuhako, M. H.; Vallada, H.; Van Sluys, M. A.; Verjovski-Almeida, S.; Vettore, A. L.; J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Title: The genome sequence of the plant pathogen A; Reference number: A82515; MUID:20365717 A; Note: for a complete list of authors see reference.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           R;anonymous, The Xylella fastidiosa Consortium Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   surface-exposed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
A; Reference number: A59328
A; Contents: annotation
C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: C82672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          urface-exposed outer membrane protein; Species: Xylella fastidiosa; Date: 18-Aug-2000 #sequence_revision
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;Accession: C8267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             615 YRGQSALSLGVSSISDSGRWVSKLQASSNTQGDFGIGVGVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STAFGSGAKATAANSAALGANSVADRANSVSVGSVGNER--QITNVAPATQGTDAVNFDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YIGKYSNASNTSSGTVSVGNTATGETRTVSNVADG-----LQATDAVNLRQLDG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWN 388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VAIG---DGAAASADGSVAIGQGSGDNGRGVE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VKIGAKTSVIKEKDGKLYTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAGWNIKGVKTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRT-----E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IGTALGNRKITGVAAGSASSDAVNVAQLTAVGDQVQQNTANITSLGGRVTTIEGSMASIA 318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ---AQGAQSLALGAGA----VTSQANSIALGAASINTVGAQSSYSAYALTAPQASVGELG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --- VGPATVVS-GDNGVGI---GNTALVGAAATGGIAIGFGTQVTAAGATAIGSAAQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IDKEGNGEIESTGDIGWSIYYDDHNTLHGATVT--LKAGDNLKIKQSGKDFTYSLKKELK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LKSISNQTNAYTNQRYSELKQDLRKQNSVLSAGIASAMSMASLTQPYTSGSSMTTIGAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LKGVAQN----LNNRIDNVNGNAR-----AGIAQAIATAGLAQAYLPGKSMMAIGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----IAASIVVVENNVSGLQNGTDGMFQVNNSSGLAKPSATGANSATGGAGSVASGNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EITRNGKNIDI--ATSMTPQFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TDTLAGSSASHV - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----VDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ----VASGTNSVAIGPASLASGNAALASGAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20-Aug-2000 #text_change 20-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     XF1516 [imported] -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -DAGNQSTH---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    reference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    xylella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Organization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -YTRAASIKDVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Xylella fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N-----N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Seque
```

A; Gene: XF1516

```
δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                           C;Date: 12-Sep-1997 #sequence_revision 17-Sep-1997 #text_change 02-Feb-2001 C;Accession: A64905; I52440; S34315 R;Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.; A; Rose, D.J.; Mau, B.; Shao, Y. Science 277, 1453-1462, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
             A;Title: The complete genome sequence of Escherichia A;Reference number: A64720; MUID:97426617
                                                                                                                           ydeK protein - Escherichia (N;Alternate names: protein C;Species: Escherichia coli
                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
A; Reference number: A; Accession: A64905
                                                                                                                                                                           A64905
                                                                                                                                                                                            RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        140
                                                                                                                                                                                                                                                                                                        605
                                                                                                                                                                                                                                                                                                                                       542
                                                                                                                                                                                                                                                                                                                                                                                                                                     495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NKIYRIIWNSALNAWVVVSELTRN------HTKRASATVATAVLATLLSATVQANAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ST----LTDTLAGSSASHVDAGNQSTHY---TRAASIKDVLNAGWNIKGVKTGSTTGQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      {\tt ALGAGSMASELNVISVGGGGGGTGPAVRRIVNVGDGIGNNDAVNKSQLDG-VTASVNDVA}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DTDEDEELESVARSAL-----VLQFMIDKEGNGEIE--STGD-----IGWSIYYDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NQIYRKFWNLSLGSWSVASHMTNDGGCSDVVLRHSGVRNRSLVLAIGLALTSVT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ASVKTIALTNQVTGSSVASA-SGKESTAIGSGAQAVADNTVAFGGRAIANAVGASALGFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KLSFGANGNKVNITS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NNSTATGYFSKAFAPNATALGYNSSYTQSANNGVAL---GSNSTVS------GVNSV 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----HAQSVKSPAMVTASKVMVAHVDSQVNRTADRIPTGDGSELMTHMALDWKFFPFG
                                                                                                                                                                                                                                          DAGVSGKDSIALGY
                                                                                                                                                                                                                                                                        SRGHFG-TSASVGY
                                                                                                                                                                                                                                                                                                                                                                     AVNKSQLDGVTASVNDVAASVKKIVGTIQITGSGVASAIGKDSTATGASAQAVGDSSVAL
                                                                                                                                                                                                                                                                                                                                                                                                     VTNVAQLKGVAQNLNN----RIDNVNGNAR----AGIAQAI----ATAGLAQAYLPGKSMMAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                     AIGSSALGVDGHALGANSTALGGQSTAISEGGTSLG---YNSFVGQSATNGIALGSN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QLQNSGWNLD-----SKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ASVNDVVASVKNIAGAIQITGSGVASVSGQDSTAAGASAQAAGDSSIA----LGARSRAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TTANGQTGQADKFETV--TSGTKVTFASGNGTTAT-VSKDDQGNITVKYDVNVGDALNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             {\tt LLQGVDSVALGSGSMASEPNVVSVGSGDGLRGPAVRRIVNVGDGIGNNDAVNKSQLDGVT}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IKEKDGKLVTGKG---KGENGSSTDEGEGL--VTAKEVI------DAVNKAGWRMKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ENVDFVRTYDTVEFLSADTKTTTVNVESKD-
                                                                                                                                                                                                                                                                                                      GTRATANAIGSSVLGVDSRARGINSTALGRQSNAIGDGSVSLGFNSFVRQSGEHGVALGT
                                                                                                                                                                                                                                                                                                                                                                                                                                     ----AIVSGVNSVALGAGSVASELNV----ISVGGGDGVTGPAVRRIVNVGDGIGNND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   158;
                                                                                                                                                            Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8.6%;
                                                                                                                                               coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---NSTTVGTQSVSLGQGGVSLGYNSFVGEGSFNGLALGSNSLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HGATVTLKAGDNLKIKOSGKDFTYSLKKELKDLTSVETE 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score
Pred.
                                                                                                                                                                                                                                                                                                                                      GGTYLGEAGYAIGYSSISDTGNWVIK-----GTASGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  No. 8.2e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --DTKGLNFAKETAGTNGDPTVHLNGIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
                                  coli K-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NGKRTEVKIGAKTSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         57
                                                                                                                                                                                                                                                                                                                                                                         604
                                                                                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                        544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             218
                                                                                    V.; Riley,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       33,
```

×

```
A:Molecule type: DNA
A:Residues: 689-883; K', 885-1316, S', 1318-1325 < RES>
A:Residues: 689-883; K', 885-1316, S', 1318-1325 < RES>
A:Cross-references: EMBL:X73295; NID:g312392; PIDN:CAA51730.1; PID:g312393
A:Note: the difference in length is due to a frameshift error at pos 653
C:Genetics:
A:Gene: ydek
C:Function:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Status: nucleic acid sequence not shown; translation not shown
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1-1325 <BLATY
A;Cross-references: GB:AE000248; GB:U00096; NID:g1787783; PIDN:AAC74583.1; PID:g1787788;
A;Experimental source: strain K-12, substrain MG1655
R;Cartwright, P; Timms, M; Lithbow, T; Hoj, P.; Hoogenraad, N.
Biochim. Biophys. Acta 1153, 345-347, 1993
A;Title: An Escherichia coli gene showing a potential ancestral relationship to the gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Description: probably involved in protein translocation C;Keywords: nucleotide binding; P-loop F;712-719/Region: nucleotide-binding motif A (P-loop)
                                      δÃ
                                                                                     Ъ
                                                                                                                         δÃ
                                                                                                                                                                     В
                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                   БР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Reference number: I52440; MUID:94100243
A;Accession: I52440
A;Status: translated from GB/EMBL/DDBJ
  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                       448
                                                                                                                               477
                                                                                                                                                                                                                    424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          173
                                            534
                                                                                                                                                                          388
                                                                                                                                                                                                                                                             334
                                                                                                                                                                                                                                                                                                                                                  281
                                                                                                                                                                                                                                                                                                                                                                                          328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             131
                                                                                                                                                                                                                                                                                                       384
                                                                                                                                                                                                                                                                                                                                                                                                                                       225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           107
  506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LKAGDNLKIKQSGKDFTYSLKKELKDLTSVETEKLSFGANGNK---VNITSDTKGLNFAK 163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNKIYRIIWNSALNAWVVVSELTRNHTK-----RASATVAT----AVLATLLSATVQAN 50
                                        PGKSMMAIGGGTYLGEAGYAI------GYSSISDTGNWVIKGTASGNSR----GHFGT 581
                                                                                                                                                                     DKNSVITNLGTNLGYDGHGEMNISNQGLVVSNGGSSLGYGETGVGNVSITTGGMWEVNKN
                                                                                                                                                                                                                                                                                                       NSGWNL - - -
                                                                                                                                                                                                                                                                                                                                              VQ-----DQDSVITVRRLYNGYFGNG----TVNISNNGLINNKEYSLVGVQDGSHGVVNVTD
                                                                                                                                                                                                                                                                                                                                                                                                                              VVVEKGGEWLIKNNDSSIEFQIGNQGTGEATIREGGLVTAENTIIGGNATG----IGTLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VIKEKDGK-LVTGK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTE-----VKIGAKTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YDSGNNARP---LN-VGQSGTGTLNIKQKGHVDGG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ETAGTNGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGV 223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GASLEVDN
                                                                                                                           VRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIA---TAGLAQAYL
                                                                                                                                                                                                                --NIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV-----GSKDANKP
                                                                                                                                                                                                                                                           KGHWNFLGTGEAFRYIYIGDAGDGELNVSSEGKVDSGIITAG---MKET---GTGNITVK
                                                                                                                                                                                                                                                                                                                                                                                      GQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK-YD-VNVGDALN--VNQLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTVNVEGE----DSVLTTELFEIGSYGTGSLNIT----DKGYVTSSIVAILGYQAGSNGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATDTDEDEELESVARSALVLQFMIDKEGNGEIESTGD---IGWSIYYDDHNTLHGATV-T
                                                                                     VYTTIGVAGVGNLNISDGG--KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MNRIYRVIWNCTLQVFQACSELTRRAGKTSTVNLRKSSGLTTKFSRLTLGVLLALSGSAS
-GSGIVNVSNGATLNSTGYGFIGGNASGKGIVNISTDSLWNLK-TSSTNAQLLQVGVLGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----ASLTTITTSVI--GANEDSEGTVNVLGGTWRL----
                                                                                                                                                                                                                                                                                                   -DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 245; DB 2;
Pred. No. 5.2e-05;
7; Mismatches 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DQITNIDTDVAYDAYLVGW-----YGTGVLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1325;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----YLRLGSSTGGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           176;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
563
                                                                                                                                                                     447
                                                                                                                                                                                                                                                                                                     423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           35;
```

RESULT

12

```
Q
                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                              Ş
                                                                   밁
                                                                                               Qy
                                                                                                                                   В
                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 1-1417 <STO>
A; Cross-references: GB: AE004867;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Title: Complete genome sequence of Pseudomonas A;Reference number: A82950; MUID:20437337 A;Accession: A83080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R;Stover, C.K.; Pham, X.Q.; adman, S.; Yuan, Y.; Brody, .; Lory, S.; Olson, M.V. Nature 406, 959-964, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   hypothetical protein PA4541 [imported] - Pseudomonas aeruginosa C;Species: Pseudomonas aeruginosa C;Date: 15-Sep-2000 #sequence_revision 15-Sep-2000 #text_change C;Accession: A83080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Experimental source: strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
622
                                                                                                   481
                                                                                                                                                                    428
                                                                                                                                                                                                      448
                                                                                                                                                                                                                                                                         409
                                                                                                                                                                                                                                                                                                         324
                                                                                                                                                                                                                                                                                                                                           354
                                                                                                                                                                                                                                                                                                                                                                                                              297
                                                                                                                                                                                                                                                                                                                                                                                                                                              217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                               526 -AGLAQAYLPGK-----
                                                                                                                                    503
                                                                                                                                                                                                                                        381
                                                                                                                                                                                                                                                                                                                                                                            264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ب
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANA------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PA4541
                                                                                                                                                                    TRNGKNIDIAT --- SMTPQFSSVSLGAGADAPTLSVDDEGALNVG ---- SKDANKPVRIT
                                                                                                                                                                                                                                      QLQNSGWNLDSKAVAGSSG-KVISGNVSPSKG-----KMDETVNINAGNN---IEI
                                                                                                                                                                                                                                                                                                                                                                                                            GEQGTVRVAGKQDASAIGGGNGGLVLNQGANVEIQRTAQ-VDTHADQGATGTWRILSH--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TAGTNGDPTVHLNGI-----GSTLTDTLAGSSASHVDAGNQST----HYTRAASIKDVLNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VS-NAG-SIQASEGGSIALLGARVSNDGLIQAQLGDVALGA-GQGINLNEDGDGLLNLQV
GSGLANPSSAGKGSTLHADTLARNLSTSNVEVVATRGNAHVGAPLSWDSGN--GLTLTAE
                                                                                                   NVAPGVKEGDVTNVAQLKGVAQNL-----
                                                                                                                                   SQNGANIGSGASGISVVQSQSGPSIGSGVNGVTIVQSQSGA-NIGPGVSGIDVVQTQTLP
                                                                                                                                                                                                      QSQN-GANIG----AGASGISVVQSQNSPNIGSGVNGVTVVQSQNGANIGSGASGITVVQ
                                                                                                                                                                                                                                                                       SAVQSQSG-----ANIGSG-----ANGISVVQSQNSP-----
                                                                                                                                                                                                                                                                                                       TTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALN---VN
                                                                                                                                                                                                                                                                                                                                         ----EVSVAAVGQANAAGDGSGQVHVAQGPAGANASDSNG-VTIVQQQPAVDLAAGANGT
                                                                                                                                                                                                                                                                                                                                                                         GKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DKG-SVDALAHNGGLIRADGGQVLMSARSADSLLKTVVNNQGTLEARTLRSAEGRIVLDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VTLKAGDNLKIKQSGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKE 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SDIQGRIDANGKVFLVNPNGVVFGKSAQVNVGGLVASTLDLADRDFLAGNYQFSGDSGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N---GEIESTGDI--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VSGDAGFQTSTDGRHMVIDQQSHKLITNWNEFSVRADERVSFHQPGQDAVALNRVIGRNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MNKSYTLVWNQATGCWNVASEGTRRRSKSGRGKALVVAGASLLGLFCQAPAFALPSGATV
                                                                 NLSPGANGSSIVQVQTLPDIAADAGNVHVVQVQTGGNKVFGNSATNVRSRTVQARSNENV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----TD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                            ----IKGVKTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----TDEDEELESVARSALVLQFMIDKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Erwin, A.L.; Mizoguchi, S.D.; Warrener, L.L.; Coulter, S.N.; Folger, K.R.; Kas,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PAOI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GWSIYYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GB:AE004091; NID:g9950769;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 235; DB 2;
Pred. No. 0.00019;
36; Mismatches 286
                              SMMAIGGGTYLG----EAGYAIGYSSISD 561
                                                                                                 ----NNRIDNVNGNARAGIAQAIAT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aeruginosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    --DHNTL-------HGAT 104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1417;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                         -NIGSGANGISVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PA01,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIDN: AAG07929.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    31-Dec-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   opportunistic
                                                                                                                                                                    480
                                                                                                                                                                                                                                        427
                                                                                                                                                                                                                                                                                                                                           408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                   621
                                                                                                   525
                                                                                                                                   561
                                                                                                                                                                                                      502
                                                                                                                                                                                                                                                                       447
                                                                                                                                                                                                                                                                                                         380
                                                                                                                                                                                                                                                                                                                                                                            323
                                                                                                                                                                                                                                                                                                                                                                                                              353
                                                                                                                                                                                                                                                                                                                                                                                                                                            263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Hickey,
Larbig,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSPDB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   M.J.;
```

```
probable adhesin PA4082 [imported] - Pseudomonas aeruginosa (strain PAO1) C;Species: Pseudomonas aeruginosa C;Date: 15-Sep-2000 #sequence_revision 15-Sep-2000 #text_change 31-Dec-2000 C;Accession: H83135 R;Stover, C.K.; Pham, X.Q.; Erwin, A.L.; Mizoguchi, S.D.; Warrener, P.; Hick adman, S.; Yuan, Y.; Brody, L.L.; Coulter, S.N.; Folger, K.R.; Kas, A.; Lark i. Lory, S.; Olson, M.V. Nature 406, 959-964, 2000 A;Title: Complete genome sequence of Pseudomonas aeruginosa PAO1, an opportu A;Reference number: A82950; MUID: 20437337 A;Accession: H83135
                  Ş
                                                       망
                                                                                        ρy
                                                                                                                                   Вþ
                                                                                                                                                                      Qy
                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Experimental source: strain PAO1
C; Genetics:
A; Gene: PA4082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Molecule type: DNA
A;Residues: 1-1018 <STO>
A;Cross-references: GB:AE004824; GB:AE004091; NID:g9950277;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Status: preliminary
                                                                                                                                     414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              680
                    518
                                                                                                                                                                                                                                                                                                                                                                                                                                                        203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120 KDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGI 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAQVDNRGTVLAQMGGVGLGAGSDLTLNFDGNKLLDIRVDAGVANALASNGGLLKADGGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LFGRGAQVNVGGLVASTLDITDAEFNGNSSRYRFTGPSTNGVLNHGGAITAAEGGSIALL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TGNWVIKG -- TASGNS
                                                                                                                                                                        ---EITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK------
                                                                                                                                                                                                                 SAVSDGVTVHA-----DTLSRNLASTNIELVS----TKGDLDLDGSVNWASGNRLGLG
                                                                                                                                                                                                                                                                                                                                                                            VLMAARTANALLNTVVNSQGAIEARSLRGKNGRIVLDGGPDGKVMVGGALSANALNGPG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYD-DHNTLHGATVTLKAGDNLKIKQSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNKCYALVWNVSQGCWNVVSEGSRRRGKPAGAKAAIASVLALLGATALAPA-----YAL
                  GIAQAIATAGLAQAYLPGKSMMAIGG---GTYLGE---AGYAIGYSSISDTG
                                                                                                                                     SAADLTLNGR------LNASGAKAGLELKAEGAIDINDKIVLGGAGSALA
                                                                                                                                                                                                                                                     -- VGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG--KMDETVNINAGNNI---
                                                                                                                                                                                                                                                                                                                     RMKTTTANGQT----GQADKFETVTSGTKVTFASGNGTTAT--VSKDDQGNITVKYDVN-
                                                                                                                                                                                                                                                                                                                                                                                                                 VKIGAKT - - - - SVIKEKDGKLYTGKGKGENG - - - - SSTDEGEGLYTAKEVIDAVNKAGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --GSTLTDTLAGSSASHVDA----GNQSTHYTRAASIKDVLNAGWNIKGVKTGST---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RGDLRINGALTAQGEN
                                                                                                -DANKPVRI - - -
                                                                                                                                                                                                                                                                                          -----HGGTVEVRGQAVE---VALGTQVNTLASNGLNGTWKIAAD-----KIDVRP
                                                     MDAGEGHRVNGTASVSLAGANATYVSGGYYYTVVQNLAQLQAINKNLDG-LYVLGGNILG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----SSIALNRV-IGTKASDIQGRIDANGQVF------LVNPNGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -VVGGSANGEIHLSGGNSLSVNQKVDKLIANWDSFSVAAGERVIFNQPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNG----KRTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     86;
=
                                                                                            TNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 232.5; DB 2;
Pred. No. 0.00016;
36; Mismatches 234;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PIDN: AAG07469.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     185;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  opportunistic
                                                                                                                                                                                                               413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hickey,
Larbig,
                                                                                                                                                                                                                                                        425
                                                                                                                                                                                                                                                                                                                                                                          321
                                                                                                                                                                                                                                                                                                                                                                                                                                                        262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSPDB:GN00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         M.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                patho
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .; Br
Lim,
```

```
R;Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.; Fgasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shinagawa, H. DNA Res. 8, 11-22, 2001
A;Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 A;Reference number: A99629; MUID:21156231; PMID:11258796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               hypothetical protein ECs2117 [imported] - Escherichia coli (strain O157:H7, C;Species: Escherichia coli C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 18-Jul-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Status: preliminary
A; Molecule type: DNA
A; Residues: 1-1343 <HAY>
                                  QΥ
                                                                                  밁
                                                                                                                       Š
                                                                                                                                                                 В
                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Cross-references: GB:BA000007; PIDN:BAB35540.1; PID:g13361583; A;Experimental source: strain O157:H7, substrain RIMD 0509952
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Reference number: A; Accession: E90893
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C; Accession: E90893
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   517
  511
                                                                                                                                                                   394
                                                                                                                                                                                                                                                   340
                                                                                                                                                                                                                                                                                             390
                                                                                                                                                                                                                                                                                                                                                                               334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            131
                                                                                                                                                                                                                                                                                                                                      283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 MNKIYRIIWNSALNAWVVVSELTRNHTK-----RASATVAT----AVLATLLSATVQAN 50
NVSNGATLNSTGYGFIGGNASGKGIVNISTDSLWNLK-TSSTNAQLLQVGVLGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LKAGDNLKIKQSGKDFTYSLKKELKDLTSVETEKLSFGANGNK---VNITSDTKGLNFAK 163
                                         AIGGGTYLGEAGYAI-----
                                                                                                                       APGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIA---TAGLAQAYLPGKSMM
                                                                                                                                                                   TNLGTNLGYDGHGEMNISNEGLVVSNGGSSLGYGETGVGKVSITTGGIWEVNKNVYTTIG
                                                                                                                                                                                                        TRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV-----GSKDANKPVRITNV
                                                                                                                                                                                                                                                                                                                                      DQDSVITVRRLYNGYFGNG---AVNISNNGLINNKEYSLVGVQDGSHGVVNVTDKGHWNF
                                                                                                                                                                                                                                                                                                                                                                               DKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK-YD-VNVGDALN--VNQLQNSGWNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                KTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VEGEDSVLTTELFE----IGSYGTGSLNITDKGYVTSSIVAILGYQANSNGKVVVEKGG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IKGVKTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNV-----ESKDNGKRTEVKIGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YDSGNNARP---LN-VGQSGTGTLNIKQKGHVDGG-----YLRLGTQAAGVGTV----N 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ETAGTNGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHY----TRAASIKDVLNAGWN 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ILAGGN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GASLEVD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATDTDEDEELESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHG----ATVT 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MNRIYRVIWNCTLQVFQACSELTRRYGKTSTVNLRKSSGLTTKFSRLTLGVLLALSGSVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSYYCTA---
                                                                              VAGVGNLNISDGG--KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNF-GSGIV
                                                                                                                                                                                                                                                     LGTGEAFRYIYIGDAGDGELNVSREGKVDSGIITAG---MKET---GTGNLTVKDKNSVI
                                                                                                                                                                                                                                                                                                                                                                                                                      -EWLIKNNDSSIEFQIGNQGTGEATIREGGLITAENTIIGGNATG----VGTLNVQ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7.6%; ilarity 24.5%; Conservative
                                                                                                                                                                                                                                                                                          -----DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN-----NIEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----LQSIGGPAGVFSGTLDGLGNSIGNLSISNTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----ASLTTITTSVI--GGNEDSEGTVNVLGGTWRL---- 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            70;
                                       -GYSSISDTGNWVIKGTASGNSR----GHFGT 581
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 228; DB 2;
Pred. No. 0.0004;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NGQIT - - - NIDTDVAYDAY - - LVGWYGTGVLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                260;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 1343;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels 164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSPDB:GN00154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                            539
                                                                                                                                                                                                            482
                                                                                                                                                                                                                                                                                             427
                                                                                                                                                                                                                                                                                                                                        339
                                                                                                                                                                                                                                                                                                                                                                               389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                       510
                                                                                                                                                                   453
                                                                                                                                                                                                                                                        393
                                                                                                                                                                                                                                                                                                                                                                                                                           282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               substrain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Han,
```

	2053	TSVPAADMAALRDGDASAQASVSNVNGNSATTTHAYSVDASAPTVTIN-TIAGDDILNAA	1995	DP 45
	ون د	AVAVSINAITADDVINAAE-KGAALTLSGSTSGVEAGQTVTVTFGGKTYSATVAANGSW	ن د	9
	530	GVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAG	485	Qy
	1935	:   :     :     : :     : :     : : :     : : :     : : :       : : :     : : :     : : :     : : :     : : :     : :     : : :     : :     : : :     : : :     : : :     : : :     : : :     : : :   : : :   : : :   : : :   : : :   : :   : : :   : :   : :   : : :   : :   : :   : : :   : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : : :   : : :   : : : :   : : : :   : : : :   : : : :   : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : : :   : : : :   : : : : :   : : : : :   : : : : :   : : : : : : : :   : : : : : :   :	1881	DЬ
	484		432	Qy
	431 1880	GKMNAGNNIEITRNG	1821	р Q
	410 1820	DOGNIT VKYDVNVGDALNVNG 	361 1761	P 65
	360 1760	VIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS :  :    :     :     :     :     :       :	310 1701	ОУ
	1700		1641	Db (
	1640	VIKKGENGSGVPASVISALAQGDVTITATVTDSAGNSGTASHTVTVALGAPVL	1583 277	Ov Db
	276	TYDTVEF	240	Qy
	239 1582	TLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDF-VR  :	186 1544	Оy
	185 1543	) LKDLTSVETEKL-SFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIGSTLTD	130 1492	Db
	129 1491	) LQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGKDFTYSLKKE 	70 1450	D Q
	69 1449	) NSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEELESVARSALV 	10 . 1409	Db Qy
3 3 ;	sqı	Match 7.5%; Score 225.5; DB 2; Length 5188; Local Similarity 21.2%; Pred. No. 0.0031; local Similarity 94; Mismatches 250; Indels 241; Ga	ery st tch	Qu Be Ma
7, substrain; D.J.; Mayhev K.; Apodaca.	157:H7, -2001 Rose, D us1s, K	X family exoprotein [imported] - Escherichia coli (strain 0 Escherichia coli [secherichia coli ] #sequence_revision 16-Feb-2001 #text_change 14-Sep	ESULT 15  85447  robable RTX f ;Species: Esc ;Date: 16-Feb ;Accession: B ;Perna, N.T.; ller, L.; Groo ature 409, 52  Title: Genom ;Reference nu ;Accession: B ;Status: prel ;Residues: 1- ;Residues: 1	RESULT B85547 C; Speci C; Date; C; Acces R; Perna iller, Nature A; Title A; Title A; Tefes A; Statur A; Statur A; Statur A; Resic A; Cross A; Cross A; Genet C; Genet

Search completed: July 3, 2002, 08:12:12 Job time: 434 sec THIS PAGE BLANK (USPTO)

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Total number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      No
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein -
       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
     245
216.5
216.5
209.5
209.5
209.5
209.5
209.5
209.5
209.6
196.5
196.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
186.5
18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BLOSUM62
Gapop 10.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    July
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SwissProt_40:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           105224 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-771-382-3
2994
       \sigma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GenCore version Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVVVS.....TASGNSRGHFGTSASVGYQW
       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    w
`
     2002, 08:29:46; Search time 48.34 Seconds
(without alignments)
471.779 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              38719550 residues
  OMPB_RICJA
BIGA_ECOLI
HLYA_PROMI
YDJA_ECOLI
120K_RICRI
100KPB_RICRI
OMPB_RICRI
OMPB_RICRI
OMPB_RICTY
ICEN_PSETY
ICEN_PSESY
ICEN_PSES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YDEK_ECOLI
AG43_ECOLI
HLYA_SERMA
AIDA_ECOLI
OMPA_RICRI
ICEN_XANCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     n 4.5
Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              105224
  P39183
P39185
P39185
P18127
P06653
P18466
P35828
P154466
P35828
P154466
P35828
P15444
Q53647
Q53647
Q53667
Q66650
P44969
P66650
P66650
Q66650
P66650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Description
                                                                                                                                                                                                                                                                                                                                                           3 r outer mem
8 caulobacter
7 campylobact
9 r outer mem
j pseudomonas
haemophilus
haemophilus
pseudomonas
pseudomonas
pseudomonas
o shigella fl
or outer mem
lactococcus
clostridium
caenorhabdi
sus scrofa
caenorhabdi
sus scrofa
caenorhabdi
bacilus st
chlamydia t
                                                                                                                                                                                                                                                                                                                                                                                                                                     O escherichia
O serratia ma
5 escherichia
1 rickettsia
7 xanthomonas
8 r outer mem
7 salmonella
6 escherichia
6 proteus mir
8 escherichia
7 rickettsia
7 rickettsia
8 router mem
7 rickettsia
8 router mem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    589
```

CCCCCCCCCCCRRRRRRRRRRRRR	OC R R R R R R R R R R R R R R R R R R R	OCS B DTT AC TE	
"A COY DNA MED CAT TO MOM MOM MED CAT TO MOM MOM MED CAT TO THE CAT TH	NESS CONTRACTOR OF THE CONTRAC	EK_EC P3 01 16 Hy	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
COTTES PART OF SEQUENCE OF 595 MEDLINE-9410024 Cartwright P.J. "An Escherichia to the genes fo MOM38."; Biochim. Biophy -1- SUBCELLULARITY: -1- SIMILARITY: -1- SIMILARITY: -1- SIMILARITY: -1- CAUTION: RE -1- FRAMESHIFT	USECIPTALIDAS  NOBI_TAXID=562  [1]  SEQUENCE FROM STRAIN-K12 / M MEDLINE-974266 Blattner F.R., Coll Gregor J., Dav MAU B., Shao Y. WAU B., Shao Y. "The Complete Science 277:14  [2]  "The Complete Science 277:14  [2]  "The Complete Science 277:14  RADLINE-972513  ALDa H., Baba Kasai H., Ksah Makino K., Mik Makade S., Nak Sampei G., Sek Takemoto K., Ti Takemoto K., Ti Takemoto K., Ti Takemoto K., Ti	LT 1 _ECOLI STA YDEK_ECOLI STA P32051; P76140; P7 01-0CT-1993 (Rel. 01-NOV-1997 (Rel. 16-0CT-2001 (Rel. Hypothetical lipop YDEK OR ORET OR B1 Escherichia coli. Bacteria; Proteoba	165 165 164.5 164.5 164 164 163.5 163.5 163.5 163.5
ob DNA sequentially of the Sylvanian of	D=562; D=562; PROM N.A. Plunk COLlado-Vik COLlado-Vik , Davis N.W hao y; Davis N.W hao y: PROM N.A. 2; PROM N.A. 2; PROM N.A. 2; Raba Tineto N. Rakamura i Nakamura i Nakamura i Nakamura i Nakamura i Nakamura i Nakamura i	I STAN 76140; P77 93 (Rel. 3 77 (Rel. 3 71 (Rel. 4 72 (Rel. 4 72 (Rel. 4 72 (Rel. 4 73 (Rel. 4 74 (Rel. 4 75 (Rel. 6 75 (	
to the 28.0-4 is-377(1996). 33-377(1996). 95-1325 FROM N 95-1325 FROM N 1243; PubMed=8; J., Timms M.W. 12 coli gene s for the mitocl bhys. Acta 115; AR LOCATION: 1 1.1. Y: TO E.COLI N Y: SOME, TO FO NEMAN SEQUENCE TO MOM 38 NEF. 3 SEQUENCE TO TIN POSITION TIN POSITION TO THE STATE OF THE ST	Published A74  Published A74  Published A74  Published A74  Published A74  Published A74	STANDARD; P77168; P77168; L 37, Cas L 40, Las poprotein poprotein i.	1258 1322 2334 948 1005 1007 1034 1196 1250 1153
8.0-40 6). 6). 70 N.A. ed=8274\ M.M.A. ed=8274\ M.M.A. M.A. OLI YEA. OLI YEA. TO FUNG. TO FUNG. TION 65.	Med-92785( tt G. II785( es J., Gla es J., Gla es G., Kirkpatt (1997). (1997). (1997). (1997). (1997). (1997). (1997). (1997).	st st	
28.0-40.1 min region 28.0-40.1 min region 96).  FROM N.A.  Med=8274505;	)3; Blance of ick same of ick same of E same o	ALIGNMENT PRT; 1329  perce upda notation up precursor na subdivis	ICEN_ERWHE ICEA_PANAN WAPA_BACSU HPI1_DEIRA Y45_CHLTR Y741_CHLMR ICEN_PANAN ICEN_PSANAN ICEY_PSEAN YFAL_ECOLI PVDB_PLAKN FLIC_SALMU
oej Fial a site membr membr HAT S	Rode Rode Goeden hia cc hia cc hia cc hia cc	AA. e) ate) on;	
kage map.  Hoogenraa ral relat ins ISP42 y a lipid SITE PRC BUE TO A brough a the EMBI restric	.T., Burla , Mayhew G ., Rose D12."; -12."; Isono K., agawa M., Motomura Motomura Motomura T., Seda J., iuchi T.;	) Enterobacteriaceae	P16239 P216239 P207833 Q07833 P56867 Q094462 Q99462 Q47879 P49051 P33479 P45508 P50493
, N.J.; onship and anchor anchor collaborations on in no	, ak i (j. n	ae;	erwinia her pantoea ana bacillus su deinococcus chlamydia m chlamydia m pantoea ana bacillus an pseudomonas escherichia aplasmodium salmonella
¥a it			asnamtscar

```
RESULT 2
AG43_ECOLI
ID AG43_E
                                                                                                                                                                                                                                                                                                                                                                                                                           δδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ДD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                              δÃ
                                                                                                                                                                              뮹
                                                                                                                                                                                                     õ
                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                         Д
                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                      밁
                                                                                            20
                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            modified and this sentities requires a or send an email to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIGNAL
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; D90793; BAA15190.1; ALT_INIT.
EMBL; D90794; BAA15197.1; ALT_INIT.
EMBL; X73295; CAA51730.1; ALT_FRAME.
PIR; S34315; S34315
ECOGene; EG11780; ydeK.
PROSITE; PS00013; PROKAR_LIPOPROTEIN; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LIPID
 AG43_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Hypothetical protein; Membrane;
                                                                      506
                                                                                                                                                                                                                                      334
                                                                                                                                                                                                                                                                 384
                                                                                                                                                                                                                                                                                            281
                                                                                                                                                                                                                                                                                                                                                                         277
                                                                                                                                                                                                                                                                                                                                                                                                                               224
                                                                                                                                                                                                                                                                                                                                                                                                                                                          131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Sin
hes 164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MNKIYRIIWNSALNAWVVVSELTRNHTK-----RASATVAT----AVLATLLSATVQAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                         YDSGNNARP-;-LN-VGQSGTGTLNIKQKGHVDGG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LKAGDNLKIKQSGKDFTYSLKKELKDLTSVETEKLSFGANGNK---VNITSDTKGLNFAK 163
                                                                                                                                                                                                                                      KGHWNFLGTGEAFRYIYIGDAGDGELNVSSEGKVDSGIITAG---MKET---GTGNITVK
                                                                                                                                                                                                                                                                 NSGWNL--
                                                                                                                                                                                                                                                                                                                                                                                                                                 KTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTE-----VKIGAKTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ETAGTNGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNRIYRVIWNCTLQVFQACSELTRRAGKTSTVNLRKSSGLTTKFSRLTLGVLLALSGSAS
                                                                                                                                                   VRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIA---TAGLAQAYL
                                                                                                                                                                               DKNSVITNLGTNLGYDGHGEMNISNQGLVVSNGGSSLGYGETGVGNVSITTGGMWEVNKN
                                                                                                                                                                                                                                                                                          vQ----
                                                                                                                                                                                                                                                                                                                    GQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK-YD-VNVGDALN--VNQLQ
                                                                                                                                                                                                                                                                                                                                               VVVEKGGEWLIKNNDSSIEFQIGNQGTGEATIREGGLVTAENTIIGGNATG----IGTLN
                                                                                                                                                                                                                                                                                                                                                                                                      GTVNVEGE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATDTDEDEELESVARSALVLQFMIDKEGNGEIESTGD---IGWSIYYDDHNTLHGATV-T
                                                                      -GSGIVNVSNGATLNSTGYGFIGGNASGKGIVNISTDSLWNLK-TSSTNAQLLQVGVLGT
                                                                                              PGKSMMAIGGGTYLGEAGYAI - - - - -
                                                                                                                          VYTTIGVAGVGNLNISDGG--KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AE000248; AAC74583
                                                                                                                                                                                                         ·NIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV····
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              884
1317
                                                                                                                                                                                                                                                                                          DQDSVITVRRLYNGYFGNG---TVNISNNGLINNKEYSLVGVQDGSHGVVNVTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Α,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      s statement is not removed a license agreement (See to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                    -DSVLTTELFEIGSYGTGSLNIT----DKGYVTSSIVAILGYQAGSNGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18
1325
19
884
1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    136514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----ASLTTITTSVI--GANEDSEGTVNVLGGTWRL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 67;
                                                                                                                                                                                                                                                                                                                                                                -GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                 DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 POTENTIAL.

HYPOTHETICAL LIPOPROTEIN YDEK.

N-ACYL DIGLYCERIDE (POTENTIAL)

N -> K (IN REF. 3).

M -> S (IN REF. 3).

MW; 26A3A066FA19AD7D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 245; DB 1;
Pred. No. 4.4e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DQITNIDTDVAYDAYLVGW-----YGTGVLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lipoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                              GYSSISDTGNWVIKGTASGNSR---
  1039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   noved. Usage by and for commercial
(See http://www.isb-sib.ch/announce/
 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1325;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----YLRLGSSTGGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                          GSKDANKP
                                                                                                 -GHFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                               447
                                                                                                                                                                                                            476
                                                                                                                                                                                                                                      387
                                                                                                                                                                                                                                                                 423
                                                                                                                                                                                                                                                                                                                       383
                                                                                                                                                                                                                                                                                                                                                                                                                                 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  130
                                                                      563
                                                                                                                                                                                                                                                                                                                                               280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 35;
```

```
SEQUENCE FROM N.A.
STRAIN=ML 308-225;
Henderson I.R., Owen
Submitted (JAN-1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=97251358; PubMed=9097040;
Itoh T., Aiba H., Baba T., Fujita K., Hayashi K., Inada T., Isono Kasai H., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T. Mizobuchi K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Mizobuchi K., Mori H., Nori T., Motomura K., Nakade S., Nakamura Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Wada C., Yamamoto Y., Horiuchi T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Science [2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Blattner F.R., Plunkett G. III, Bloch C.A., Perna Riley M., Collado-Vides J., Glasner J.D., Rode C. Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P39180; P76360; P75614; P97241; Q46771;
01-FEB-1995 (Rel. 31, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation updat
Antigen 43 precursor (AG43) (Fluffing prote
                                                                                                                                                                                                                                 GENE NAME.

MEDLINE-97557509; PubMed-9103983;

MEDLINE-97557509; PubMed-9103983;

Menderson I.R., Meehan M., Owen P.;

"Antigen 43, a phase-variable bipartite outer membrane protein,

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=K12 / MG1655;
MEDLINE=97426617; PubMed=9278503;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Antigen 43 pi
FLU OR B2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 53-63.
STRAIN=K12 / EMG2;
MEDLINE=97443975; PubMed=9298646;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "A 460-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 40.1-50.0 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-K1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mau B.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                   "Comparing the predicted and observed I in the genome of Escherichia coli K-12 Electrophoresis 18:1259-1313(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Escherichia col
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Caffrey P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY SEQUENCE STRAIN=ML 308-225;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Purification and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=89291704;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteriol, 171:3634-3640(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a unique
                                                                                                                         FUNCTION AS AN ADHESIN.
SUBUNIT: HETERODIMER OF THE
CHAIN) ANCHORED TO THE INTEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Res. 3:379-392(1996).
                                                           SUBCELLULAR SIMILARITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complete genome sequence of 
nce 277:1453-1474(1997).
                                                                                                                                                                                                               Microbiol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Shao
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Robison
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Owen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein coli.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Y.;
                                                                                                                                                                                           CONTROLS
                                                                                                                                                                                                             Lett.
                                                             LOCATION: OUTER MEMBRATO ADHESIN AIDI-I AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P
                                                                                                                                                                                                                                                                                                                                                                                                                                             χ.
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-terminal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PubMed=2661530;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            terminal sequence of the complex associated with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             엵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   to;
                                                                                                                                                                                         149:115-120(1997)
S COLONY FORM VARI
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Church
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             53-78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the EMBL/GenBank/DDBJ
copyright. It is produced through a collaboration tute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gamma
                                                                                                                                INTEGRAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                     G.M.;
                                                                MEMBRANE ASSOCIATED.
-I AND TO BORDETELLA PERTACTIN.
                                                                                                                              PERIPHERAL
GRAL OUTER N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Escherichia
                                                                                                                                                                                              VARIATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          update)
protein).
                                                                                                                                                                                                                                                                                                                                                                                                              properties of proteins encoded
}.";
                                                                                                                                  MEMBRANE
                                                                                                                                                      MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Enterobacteriaceae;
                                                                                                                                                                                              AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a N.T., Burl
.K., Mayhew
                                                                                                                                                                                           AUTOAGGREGATION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         . A . ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 K-12.";
                                                                                                                                  PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         subunit of antigen
                                                                                                                                                        PROTEIN (ALPHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Seki Y.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             T., Isono
Miki T.,
                                                                                                                                  (BETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۲
;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .
```

SWISS-PROT entry

is

the

```
Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; AE000291; AAC75061.1; ALT_INIT. EMBL; D9038; BAA15825.1; ALT_INIT. EMBL; D90839; BAA5832.1; ALT_INIT. EMBL; U24429; AAB47869.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Outer membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EcoGene;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /ARIANT
339
                                      291
                                                                            286
                                                                                                                                                      240
                                                                                                                                                                                          171
                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                    133
                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                  107
                                                                                                              231
                                                                                                                                                                                                                                                                                                                                                                                    65
                                                                                                                                                                                                                                                                                                                                                                                                                          55
                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLAT----LLSATVQANATDT--
                                                                                                                                                                                                                                                                                                      LQRVNPGGSVSDTVISAGGGQSLQGRAVNTTLNGGEQWMHEGAIATGTVINDKGWQVVKP 179
                                                                                                                                                                                                                                                                                                                                                                                    GGTLANHDNQIVFGTTNGMTISTGLEYGPDNEANTGGQ-----WVQDGGTANKTTVTSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNVVLENGGRLDVLTGHTATNTRVDDGGTLDVRNGGTATTVSMGNGGVLLADSGAAV-SG
                                    KG---
                                                                                                                                                                                      DPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTG
                                                                                                                                                                                                                              GTVATDTVVNTGAEGGPDAENGDTGQFVRGDAVRTTINKNGRQIVRAEGTANTTVVYAGG
                                                                                                                                                                                                                                                                    LTSVETEKLSFGANGN-----
                                                                                                                                                                                                                                                                                                                                                                                                                      ---- DEDEELESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVT---
                                                                                                            QSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EG12686;
                                    ENGSSTDEGEGLVTAKEVID-----AVNKAGWRMKTTTANGQTGQADKFETVTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                    -GHALDTTLNG-----GYQYVHNGGTASDTVVNSDGWQI--VKNGGVAG
                                                                        -TVNQKGRLQVDAGGTATNVTLKQGGALVTSTAATVTGINRLGAFSVVEGKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          551
1039
                                                                                                                                                                                                                                                                                                                                              -LKAGDNLKIKQSGKDFTYSLKKE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  157
188
305
320
372
372
372
709
709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      106841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ANTIGEN 43 BETA CHAIN

K -> N (IN STRAIN ML 308-225).

SL -> FF (IN STRAIN ML 308-225).

T -> K (IN STRAIN ML 308-225).

Y -> K (IN STRAIN ML 308-225).

V -> F (IN STRAIN ML 308-225).

V -> F (IN STRAIN ML 308-225).

ATN -> STI (IN STRAIN ML 308-225).

A -> T (IN STRAIN ML 308-225).

N -> Q (IN STRAIN ML 308-225).

E -> V (IN STRAIN ML 308-225).

F -> V (IN STRAIN ML 308-225).

H -> Y (IN STRAIN ML 308-225).

G -> K (IN STRAIN ML 308-225).

G -> C -> S (IN STRAIN ML 308-225).

S -> P (IN STRAIN ML 308-225).

G -> V (IN STRAIN ML 308-225).

G -> V (IN STRAIN ML 308-225).

S -> P (IN STRAIN ML 308-225).

C -> S (IN STRAIN ML 308-225).

C -> S (IN STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LNLVHTS -> MNLIYNA (IN STRAIN ML 308 225).

225).

OGT -> LGA (IN STRAIN ML 308 225).

S -> T (IN STRAIN ML 308 225).

Q -> L (IN STRAIN ML 308 225).

S -> I (IN STRAIN ML 308 225).

S -> I (IN STRAIN ML 308 225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 216.5; 1
Pred. No. 0.000
90; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ANTIGEN 43 ALPHA CHAIN.
ANTIGEN 43 BETA CHAIN.
                                                                                                                                                                                                                                                                  -----KVNITSDTKGLNFAKETAGT----NG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N -> STI (IN STRAIN ML 308-225).
-> T (IN STRAIN ML 308-225).
-> Q (IN STRAIN ML 308-225).
-> V (IN STRAIN ML 308-225).
-> V (IN STRAIN ML 308-225).
-> Y (IN STRAIN ML 308-225).
-> X (IN STRAIN ML 308-225).
-> X (IN STRAIN ML 308-225).
-> T (IN STRAIN ML 308-225).
-> T (IN STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -> TTT (IN REF. 5).
5170D647C8DEEBE0 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; DB 1;
.00085;
les 283;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (IN STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    308-225).
ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels 199;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 1039;
                                                                                                                                                                                                                                                                                                                                              -LKB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          308-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                              64
                                                                                                                                                                                                                                                                                                                                                                                    119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5
                                                                                                                                                                                                                                                                  170
                                    342
                                                                          338
                                                                                                                                                                                                                              239
                                                                                                                                                    285
                                                                                                                                                                                          230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          27;
```

Q

S

밁 Š 밁

20

24

RNHTKRASATVATAVLATLLSA--TVQANATDTDEDEELESVARSALVLQFMIDKEGNGE 81

Query Match
Best Local Similarity
Matches 158; Conserv

Conservative

90;

7.2%; 22.1%;

Score 216.5; | Pred. No. 0.00; | Mismatches

; DB .0014;

۲:

1608;

269;

Indels Length

199;

32;

Ş 뫄 Ş 밁

Дb

Ş DЬ Qy

밁

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
 HLYA_SERMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P15320;
01-APR-1990
01-APR-1990
01-NOV-1990
CHAIN
SEQUENCE
                                                                                                                     between the Swiss Institute of Bioinformatics the European Bioinformatics Institute. There a use by non-profit institutions as long as i modified and this statement is not removed. Us
                                                                                                                                                                                                                                                                                        J. Bacteriol. 170:3177-3188(1988).
-!- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT
                                                    EMBL; M22618; AAA50323.1; -. PIR; A28182; A28182.
                                                                                             entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                  -!- FUNCTION: CELL-BOUND HEMOLYSIN, WHICH ERYTHROCYTES BY INTERACTION WITH THE F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HLYA_SERMA
                           SIGNAL
                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through
                                                                                                                                                                                                                                                                                                                                     marcescens.
                                                                                                                                                                                                                                                                                                                                                                 Poole K., Schiebel E., Braun V.;
                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=88257037; PubMed=3290200;
                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Serratia marcescens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hemolysin precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     343
                                       demolysis;
                                                                                                                                                                                                                                                                                                                                                    "Molecular characterization of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 400
                                                                                                                                                                                                          SUBCELLULAR LOCATION: Outer membrane. SIMILARITY: TO P.MIRABILIS HEMOLYSIN (HPMA).
                                                                                                                                                                                                                                    ERYTHROCYTES BY INTERACTION WITH REQUIRES SHLB FUNCTION.
                                                                                                                                                                                                                                                                                 DEFINED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TRSDGKAFSIGGGQADALMLEKGSSFT----LNAGDTATDTTVNGGLFTARGGTLAGTT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----DRLVIDGG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GLAQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNATVQSVVDDLSHAGQIHFTSTRTGKFVPATLKVKNLNGQNGTISLRVRPDMAQNNA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --AQLKGVAQNLNN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NLNEG----TLTLNDSTVTTDVIAQRGTALKLTGSTVLNGAIDPTNVT--LASGATWNIP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SLGAGADAPTLSVDDEGALN-------VGSKDANKPVRITNVAPGVKEGDVTNV- 494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TLNNGAILTLSGKTVNNDTLTIREGDALLQGGSLTGNGSVEKSGSGTLTVSNTTLTQKAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KVISGNVSPSKGKM--DETVNINAGN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TK---VTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Proteobacteria;
                                        Toxin; Outer membrane; Signal
 1608 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Rel. 14, Created)
(Rel. 14, Last sequence update)
(Rel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
              1608
                                                                                                                                                                                                                                                                                                                                                                                                          AND SEQUENCE
 165078 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               gamma
 HEMOLYSIN.
FW; D669B476FE7DAD51 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----RATGKTILNLVNAGNSASGLATS
                                                                                                                                                                                                                                                                                                                                                                                                          OF.
                                                                                                                                                                                                                                                                                                                                                    hemolysin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1608 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----NIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -RIDNVNG-----NARAGIAQAIATA 526
                                                                                                                                     There are no rest
                                                                                                                                                                                                                                                     ERYTHROCYTE MEMBRANE.
                                                                                                                                                                                                                                                                 RELEASES HEME-IRON
                                                                                                                           Usage
                                                                                                                                                                                                                                                                                                                                                     determinant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Enterobacteriaceae;
                                                                                                                                                                  and the
                                                                                                                                                    restrictions
                                                                                                                           and
                                                                                                                                                                 EMBL
                                                                                                                                                                                                                                                                                                                                                     of.
                                                                                                                                          is
                                                                                                                                                                       a collaboration
                                                                                                                                                                                                                                                                                              K BLOOD
CLEARLY
                                                                                                                                                                                                                                                                                                                                                    Serratia
                                                                                                                                                                    outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             582
                                                                                                                                                                                                                                                     SHLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               566
                                                                                                                                          way
```

```
RESULT 4
AIDA_ECOLI
ID AIDA_E
AC Q03155
AC Q03155
AT Q1-JUN
DT Q1-JUN
RCBI_J
RV [1]
RP SEQUEL
RC STRAIL
RX MEDLIL
RA BENZ
RT "AIDA
RT SYNTH
RL MO1.
RL MO1.
CC -i-F
CC A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B. 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                               맑
                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                           "AIDA-I, the adhesin involved in diffuse adherence of the diarrhoeagenic Escherichia coli strain 2787 (0126:H27), synthesized via a precursor molecule."; Mol. Microbiol. 6:1539-1546(1992).
                                                                                                      SEQUENCE FROM N.A., AND SEQUENCE STRAIN=2787 (0126:H27);
MEDLINE=92326638; PubMed=1625582;
                                                                                                                                                                                                                                                                                                        Q03155;
                                                                                                                                                                                                                                                                                                                                                                                                               1017
                                                                                                                                                                                                   Bacteria; Proteobacteria;
                                                                                                                                                                                                                Plasmid pIB6
                                                                                                                                                                   NCBI_TaxID=562;
                                                                                                                                                                                     Escherichia.
                                                                                                                                                                                                                                 Escherichia coli.
                                                                                                                                                                                                                                                          Adhesin aidA-I precursor
                                                                                                                                                                                                                                                                                                                                       AIDA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             396
                                                                                                                                                                                                                                                                                                                                                                                                                                           537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           175
                                                                                                                                                                                                                                                                           1-JUN-1994
1-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              82
                                                                                                                                                                                                                                                                                                          -JUN-1994
                  FUNCTION: THIS
    ADHERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          I., Schmidt M.A.;
                                                                                                                                                                                                                                                                                                                                                                                                               G----EGGTQRSNSSASQAVTGSIDAANGINVNVKKDAIYQGTALNGGRGKTAVNA 1068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DADNQIQVGVQKTANAKAVRDDKTSWGGIGGGDNKNN--SNRREISHASEL--TSGG-TL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KAAKLDA-TGVINDIGGIGAPNVGLDIGAQGGSSEKRSSSQAVVSSVQAGSIDINAKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AYQENAAGVDHLAAADTASTTTKTDVGVNI-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GGIDKLGSGVEAGYENNKTQAQSSKAITSGSDVKGNLT----INARDKLTQQGAQHSVGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KLVTGKGKGENGSSTDEGEGLVT----AKEVIDAVNKAGWRM-----KTT------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TSSSHKADNSYQSSTASELKSDTNLTLVSHKDADVIGSQVASGGELSVESKTGNINVK--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TGQSENVDFVRTYDTVEELSADTKTTTVNVESKD-NGKRT----EVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RLNGQQGVTITGSKARGQKGGEVTATHGGLRIDNALSTTVDKIDA-----RTGTAFNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HLNG-IGSTLTDTLA-GSSASHVDAGNQSTHYTRAASIK-DVLNAGWNIKGVKTGST---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SLKKELK------DLTSVETEKLSFGANG---NKVNITSDTKGLNFAKETAGTNGDPTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RGYQRNHTSSLRTGRWS-NSDESESLKASELRSEGELTLKAGRNVSTQGAKVHAQRDLTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----IESTGDIGWSIYYDDHNTLHGA-----TVTLKAGDNLKIK----QSGKDFTY
                                                                                                                                                                                                                                                                                                                                                                                                                                         SMMAIGGGTYLGEAGYAIGYSSISDTGNW-----VIKGTASGNSRGHFGTSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VRDQGTQYQASKG-AVNLTADSHRSEAAANRQDEQSRDTRGSAGVRVYTTTGSDLTVDAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LGAGADAPTLSVDDEG-----ALNVGSKDANKPVRITN---VAPGVKEGDV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LSGGSVKLKAEKDVTFSGSKLVADKGDASVSGNKVSFLAADDKTASNTEQTKIGGGFYYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -TNVAQLKGVAQNLN-----NRIDNVNGNARAGIAQAIATAGLAQAYLPGK
                                                                                                                                                                                                                                                                        (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAERQQNIDEQKTALTVNGYAKEAGDKQYRAGLRIEHTRDSEKTTRTENSASS
    QF.
                                                                                                                                                                                                                                                                                                                                       STANDARD;
   IS IS AN ADHESION DIARRHEA-CAUSING
                                                                                                                                                                                                                                                                         29, Creat
29, Last
29, Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -TANGQTGQADKFETVTSGTKVTFASGNGTTA----
                                                                                                                                                                                                                                                                                                        Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----TVSKDDQGNITVKYDVNVGDALNVNQLQNSGWN
                                                                                                                                                                                                  gamma
                                                                                                                                                                                                                                                                         sequence update)
annotation update)
                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                                   subdivision; Enterobacteriaceae;
                                                                                                                                        QF
   PROTEIN NECESSARY
ENTEROPATHOGENIC I
                                                                                                                                                                                                                                                                                                                                       1286
                                                                                                                                                                                                                                                                                                                                       3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -GANVDYSAVTRPVERAVG
   ESCHERICHIA COLI
                  FOR
                                                              the
), is
                 THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  283
```

ŧ

```
Ω
                                                            밁
                                                                                         Qy
                                                                                                                          В
                                                                                                                                                    δÃ
                                                                                                                                                                                      B
                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Sin
Matches 136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CHAIN
PROPEP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; X65022; CAA46
PIR; S28634; S28634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Cell
595
                                                                                             488
                                                                                                                            510
                                                                                                                                                                                        454
                                                                                                                                                                                                                      409
                                                                                                                                                                                                                                                     401
                                                                                                                                                                                                                                                                                                                    349
                                                                                                                                                                                                                                                                                                                                                302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      112
                               548
                                                                                                                                                           456
                                                                                                                                                                                                                                                                                     358
                                                                                                                                                                                                                                                                                                                                                                               289
                                                                                                                                                                                                                                                                                                                                                                                                              257
                                                                                                                                                                                                                                                                                                                                                                                                                                             229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <del>د.</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 MNKIYRIIWNSALNAWVVVSELTRNH-----TKRASATVATA--VLATLLSATVQANA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TO EPITHELIAL CELLS. SUBCELLULAR LOCATION: Outer membrane.
YDGGQVTG-TNIKNGGTIRVDSGASALNIALSSGGNLFTS
                           GEAGYAIGYSSISDTGNWVIKGTASG-----NSRGHFGTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KDVLNAGW----VIKGVKTGST-TGQSENVD-----FVRTYDT---VEFLSADTKTTTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DSTNISSGGQQRVSSGGVASNTTINSSGAQNILSE--EGAISTHISSGGNQYISAGANAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NITSDTKGLNFAKETAGTNGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HGATVT -- LKAGDNLKIKQSGKDFTYSLK -- - KELKDLTSVETEKLSFGAN -- --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TVSSGETQIVYSGRGNSNATVNSGGTQIVNNGGKTTATTVNSSGSQNVGTS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TDTDEDEELESVAR---SALVLQFMIDKEGNG-----EIESTG--DIGWSIYYDDHNTL 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNKAYSIIWSHSRQAWIVASELARGHGFVLAKNTLLVLAVVSTIGNAFAVNISGTVSSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      adhesion;
                                                                                                                          ---NVNLSGRLNAFAGNVVGTILNQEGRQYVYSGATATSTVGNNEGREYV---
                                                                                                                                                         PTLSVDDEGALN---
                                                                                                                                                                                        VQNSVVVTRTVSSAAKPFDAEVYSGGKQTVYLWRGIWYSNFLTAVWSMFPGTASGA----
                                                                                                                                                                                                                                                      NNSGRENVS-----NGGVSYNAMINTGGNQYIYSDGEATAAIVNTSGFQRINSGGTAP
                                                                                                                                                                                                                                                                                     SKDDQGNITVKYDVNVGDALNVNQLQNSGWNL------DSKAVAGSSG--KVISGNVSP
                                                                                                                                                                                                                                                                                                                    QHIRNGGIASGTI---VNQSGY---VNISSG--GYAESTIINSGGTLRVLSDGYARGTIL
                                                                                                                                                                                                                                                                                                                                              ----EGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                              NVESKDN-----GKRTEVKIGAKTSVIKE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GATISTIVNSGGIQRVSSGGVASATNLSGGAQNIYNLGHASNTVIFSGGNQTIFSGGIT 170
                                                                                         EGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMAIGGGTYL
                                                                                                                                                                                                                      SKGKMDETVNINAGN---NIEITRNGKNI----
                                                                                                                                                                                                                                                                                                                                                                                                                                             ETIVNSGGFQRVNSGAVATGTVLSGGTQNVSSGGSAISTSVYNSGVQTVFAGATVTDTTV
                                                                                                                                                                                                                                                                                                                                                                               NSGGNQNISSGGIVSETTVNVSGTQNIYSGGSALSANIKGSQIVNSEGTAINTLVSDGGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity 19.4%; P136; Conservative 122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1286 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CAA46156.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1286
N; 132271 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Outer membrane; Plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 209.5; DB 1;
Pred. No. 0.0024;
22; Mismatches 257;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADHESIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B2A00F72AC05FB34
                                                              SGGLQAVSSGGKASA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                             ----KDGKLVTGKGKGENGSSTDEG-
                                                                                                                                                                                                                      -DIATSMTPQFSSVSLGAGADA
                                                                                                                                                       VGSKDANKPVRITNVAPGVK
633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                              -TVINEGGAQFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1286;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               185;
                                                                                                                          -LSGGIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GNKV 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                         455
                                                                                                                                                                                                                                                                                     408
                                                                                                                                                                                                                                                                                                                    400
                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                51
                                                               594
                                                                                              547
                                                                                                                                                                                          509
                                                                                                                                                                                                                                                        453
                                                                                                                                                                                                                                                                                                                                                   357
                                                                                                                                                                                                                                                                                                                                                                                                                                             288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               32;
```

```
Q
                                                                             В
                                                                                                                Q
                                                                                                                                                                                                                                                           STATE TO THE TENT OF THE TENT 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OMPA_
  B
                                                                                                                                                   Query Match
Best Local Similarity
Matches 153; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P15921;
01-APR-1990
                                                                                                                                                                                                                                                                                                                     REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Anderson B.E., McDonald G.A., Jones D.C., Re "A protective protein antiqen of Rickettsia repeated, near-identical sequences.";
Infect. Immun. 58:2760-2769(1990).
Infect. Immun. 58:2760-2769(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; M31227; AAA26380.1; PIR; A41477; A41477.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      use by non-profit institutions as long modified and this statement is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=90354033; PubMed=2117568;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria; alpha subdivision; Rickettsiales; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Outer membrane protein A precursor (190 kDa antigen) (Cell surface
                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pfam; PF02708; rOmpA_rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rickettsia rickettsii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     antigen) (rOmpA) (rOmp A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OMPA_RICRI
                                                                                                                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      InterPro; IPR003858; rOmpA_rOmpB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-APR-1990 (Rel.
16-OCT-2001 (Rel.
  790
                                                                             730
                                      82
                                                                                                                    30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -APR-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SUBCELLULAR LOCATION: CELL WALL.
S-LAYER WITH HEXAGONAL SYMMETRY.
PTM: GLYCOSYLATED (PROBABLE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SIMILARITY: BELONGS TO THE RICKETTSIAE
  NGALSQVTGDIG-
                                                                                                              ASATV-ATAVLATLLSATVQANATDTDEDEELESVARSALVLQFMIDKEGNGE------
                                      ----IESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGKDFTYSLKKELKDLTSVE 137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        requires a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Repeat;
                                                                                                                                                                                                                                                                                              800
875
950
1022
1094
                                                                                                                                                                                                                                           29 2249
212 1180
212 286
287 358
159 430
505 577
18 652
3 724
5 799
1 1021
1 1093
1 1165
1 1180
1 180
                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            14,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        license
                                                                                                                                                                           6.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Cell wall;
NTNSLATISVGAGTATLGGAVIKATTTKLTNAASVLTLTN 841
                                                                                                                                                     72;
                                                                                                                                                                                                                                                 L (TYP
M (TYI
TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        agreement
                                                                                                                                                                           Score 203.5; DB 1; Pred. No. 0.0093;
                                                                                                                                                                                                                                                                                                                                                       4 H H G T E D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          POTENTIAL.
OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                  (TYPE
                                                                                                                                                                                                                                                                                                                                                                          (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                     (TYPE
                                                                                                                                                                                                                                                                                                                                                       (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                               (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                     (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   X APPROXIMATE (TYPE I).
                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                       E I (INCOMPLETE).
A9D6646C089DF087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S-layer; Glycoprotein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    THIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Regnery R.L.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                rickettsii has tandemly
                                                                                                                                                         257;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TANDEM REPEATS
                                                                                                                                                         Indels
                                                                                                                                                                                                                                                         CRC64;
                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                              2249;
                                                                                                                                                         201;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ΥВ
                                                                                                                                                       Gaps
                                                                                                                  81
                                                                                                                                                         32;
```

```
Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
CCCCCCCCCTTTAXCCTXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                            ICEN_XANCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1061
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1001
                         :-
                                                                                                                                                           MO1
                                                                                                                                                                       Xanthomonas campestris
                                                                                                                                                                                                       Zhao
                                                                                                                                                                                                                                    STRAIN-X56S
                                                                                                                                                                                                                                                 SEQUENCE FROM
                                                                                                                                                                                                                                                                                                           Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                       Xanthomonas campestris
                                                                                                                                                                                                                                                                                                                                                     Ice
                                                                                                                                                                                                                                                                                                                                                                                 01-NOV-1990
                                                                                                                                                                                                                                                                                                                                                                                              01-NOV-1990
                                                                                                                                                                                                                                                                                                                                                                                                               P18127;
                                                        ÷
                                                                                                                -
                                                                                                                                                                                                                    MEDLINE-91080859;
                                                                                                                                                                                                                                                                            NCBI_TaxID=343;
                                                                                                                                                                                                                                                                                                                                                                   16-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                           ICEN_XANCT
                                                                                                                                               ÷
                                                                                                                                                                                     'Conserved repetition in the ice nucleation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 138 TEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIGSTLTDTLAGSSA---SH
                                                                   CRYSTALLIZATION IN SUPERCOOLED WATER.
SUBCELLULAR LOCATION: Outer membrane (By similarity).
DOMAIN: CONTAINS 153 IMPERFECT REPEATS OF THE CONSENS
OCTAPEPFIDE A-G-Y-G-S-T-L-T; FURTHER ON A 16-RESIDUE
REGIONAL 48-RESIDUE PERIODICITY IS SUPERIMPOSED.
                                                                                                                                            thomonas campestris pv. translucens."; Gen. Genet. 223:163-166(1990).
FUNCTION: ICE NUCLEATION PROTEINS ENABLE
                         MISCELLANEOUS: A STRUCTURAL MODEL IS SUGGESTED IN WHICH NUCLEATION PROTEIN DISPLAYS A SYMMETRY RELATED TO THAT ( SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION PROT
                                                                                                                                                                                                                                                                                                                                                    nucleation
                                                                                                                                                                                                   J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VFNGGVNGLNVGSNVAGTARNIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GVVKANTINLTDNASAVTFTNPVVVTGAIDNTG-NANNGIVTFTGNSTVTGDI-----GNT 1169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NTGNANNGIVTFTGNSTVTGNVGNTNALATVNVGAGLLQVQGGVVKANTINLTDNASAVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GALSQVTGDIGNTNSLATISVGAGTATLGGAVIKATTTKLTDAASAVKFTNPVVVTGAID 1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VIKGTASGNSRGH--FGTSASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LVLSNLTG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --IDNVNGNARAGIAQAIATAGLAQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALNVGSKDANK-----PVRITNVAPG-----VKEGDVTNVAQLKGVAQNLNNR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NALATVNVGAGITLQAGGSLAANNIDFGARSTLEFNGPLDGGGKAIPYYFKGAIANGNNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DETVNINAGNNIEITRNG----KNIDIATSMTPQFSSVSLGAGADAP----TLSVDDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FTNPVVVTGAIDNTGNANNGI-VTFTGNSTVTGNV-----GNTNALATVNVGAGLLQVQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DTVEFLSADTKTT----TVNVESKD----NG---KRTEVKIGAKTSVIKEKDGKLVTG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VGAGTATLGGAVIKATTTKLTNAASVLTLTNA----NAVLTGAIDNTTG-GDNVGVLNLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ANAVLTGAVDN --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ILNVNTKLLTASHLTIGTVAEINIGAGNLFTIDASVGDVTILN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----GOTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDAL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -KGKGENGSSTDEGEGLVTAK----EVIDAVNKA-----
                                                                                                                                                                                                   Orser C
                                                                                                                                                                                                                                                                                                                                                                  (Rel. 16, Created)
(Rel. 16, Last sequence
(Rel. 40, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VGVNNILLAADLV - - - APG
                                                                                                                                                                                                                     PubMed=2259339;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ·QSTHYTRAASIKDVLNAGWNIKGVKTG---STTGQSENVDFVRTY
                                                                                                                                                                                                                                                                                                                                                                  Last annotation update
                                                                                                                                                                                                                                                                                                                       (pv.
                                                                                                                                                                                                                                                                                                        gamma subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----TTGGDNVGVLNLNGALSQVTGDIGNTNSLATIS
                                                                                                                                                                                                                                                                                                                       translucens)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                586
                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -QLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM 413
                                                                                                                                                                                                                                                                                                                                                                                                                             1567
                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                                                           ₿
                                                                                                                                                                                        gene
                                                                                                                                             BACTERIA
                                                                                                                                                                                                                                                                                                        Xanthomonas group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GWRMKTTTAN-----
                                                                                                                                                                                        inaX
                                                                                                    CONSENSUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -AQNINFRARDSV
                                                                                                                                               ö
                           PROTEIN
                                                                                     AND
                                                                                                                                               NUCLEATE
                                                      THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADEGTV 1314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1060
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                288
```

```
OMPB
ACC DT DT DT DT DE DE DE DE OS
                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEE DE RESERVE DE RESE
                                                                                                                                                                                                                                                                                                                                          RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                            30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kba surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) [Contains: 120 kba surface-exposed protein (Surface protein)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     use by non-profit institutions as long a modified and this statement is not removed. entitles requires a license agreement (See lor send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                  RICJA
                                                                                                                                                                                                                                                                                                                                                                                                                               1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; IPR000258; Ice_nucleatn.
Pfam; PF00818; Ice_nucleation; 81.
PRINTS; PR00327; ICENUCLEATN.
PROSITE; PS00314; ICE_NUCLEATION; 57.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1032
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; X52970; CAA37140.1; PIR; S11672; S11672.
  Rickettsia
                                                     antigen) (120
                                                                                                                                                                                                                          30-MAY-2000
                                                                                                                                                                                                                                                                                  OMPB_RICJA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HSSP; P06620; 1INA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 542 GGGTYLGEAGY----AIGYSSISDTG--NWVIKGTASGNSRGH------FGTSASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       983
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    882
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity nes 118; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   78 GNGEIESTGDIGWSIYYDDHNTL-HGATVTLKAGDNL-----KIKQSGKDFTYSLKKELK 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nucleation;
                                                                                                                                                                                                                                                                                                                                                                                                                            YGST--STAGYDSTLTAGYGSTQTAGYKSTLTAGYGSNSTAGHESSLIAGYGSTQIAGYE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QTAREDSSLTAGYGSTSTAGHDSSLIAGYGSTQTAGYNSILTTGYGSTQTAQESSSLTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SSLTAGY---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRTYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DLTSVETEKLSFGANGNKVNITSDTKGLNFAKE-----TAGTNGDPTVHLNGIGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GYGSTQTSGS-----DSSLTAGYGSTQTARKGSDITAGYGSTGTAGADSTL----IA 828
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ST-QTARQGSDI-----TAGYGSTGT-AGADSSLIA--GYGSTQTAGYDSNLTAGYGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STQTSGSDSSLTAGYGSTQTARKGSDMTAGYGSTGTAGADSTLIAGYGSTQTSGS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QT---AGSDSS-LTAGYGSTQTARKGS--DV-TAGY-----GSTGTAGADSTLIAGYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GYGSTQT-----SGSDSSLTAGYGSTQTAREGSDVTAGYGSTGTAGADSTLISGYGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APGVKEGDYTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATA-GLAQAYLPGKSMMAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IPR000258; Ice_nucleatn
0818; Ice_nucleation; 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1567
Japonica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Repeat;
AA; 15
                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \hbox{-} GSTQTARQGSDVTAGYGSTGTAGADSTLIAGYGSTQTAGSDSSLTAGYG
                                                          outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        152548 MW;
                                                        membrane protein ompB);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Outer membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 196;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C8B451D959ECAD63
                                                                                                                                                                                                                                                                                     1656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .014;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 1;
                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              250;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Usage by and
                                                        32 kDa beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          he EMBL outstation restrictions on it tent is in no wa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tor
                                                                                     protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23;
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2
                                                                                γQ
                                                                                                              B
                                                                                                                                       Š
                                                                                                                                                                     뫄
                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                    Вр
밁
                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          between the Swiss Institute of Bioinformatics and the the European Bioinformatics Institute. There are no reuse by non-profit institutions as long as its contemmodified and this statement is not removed. Usage by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Submitted (MAY-1997) to -i- FUNCTION: THE 120 KT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Sequencing japonica.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsiaceae; F
NCBI_TaxID=35790;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Proteobacteria; alpha subdivision; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        InterPro; IPR003858; rOmpA_rOmpB
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AB003681; BAA20138.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -!- FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Uchiyama T.;
807
                                                                                                                                                                      643
                                                                                                                                                                                                                                                                                      525
                            374
                                                        750
                                                                                   322
                                                                                                               700
                                                                                                                                          265
                                                                                                                                                                                                   221
                                                                                                                                                                                                                                                        162
                                                                                                                                                                                                                                                                                                                 102
                                                                                                                                                                                                                                                                                                                                             465
                                                                                                                                                                                                                                                                                                                                                                                                      405
                                                                                                                                                                                                                                                                                                                                                                          64
                                                                                                                                                                                                                                                                                                                                                                                                                                 13 LNAWVVVSE---LTRNHTKRA-----SATVATAVLATLLSATVQANATDTDEDEELESV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (BY SIMILARITY).
SUBCELLULAR LOCATION: CELL WALL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRUCTURAL PROTEIN WHICH MAY PLAY VIRULENCE FACTOR AND/OR IMMUNOGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FUNCTION: THE 120 KDA SURFACE-EXPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LAYER WITH HEXAGONAL SYMMETRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SWISS-PROT entry is copyright. It is produced through
                                                                                                                                                                                                                                                                                                                                            GVGVVQLSGTHTAELRLGNAGSVFKLADGTVINGKVNQTVLVGGVLAAGAITLDGSATIT
                          GDALNYNQLQNSG---WNLDSKA-----VAGSSGKVIS--GNVSPSKGKMDETVN
                                                                                                                                                                                                                                                                                                                                                                          ARSALVL-----QFMIDKEG------NGEIESTGDIG-----WSIYYDDHNTLH 101
ADGTGIVEFVNTGPINVTLNKQAVPVNALKQITVSGPGNVVVNEIGNAGNYHGAMTDTIA
                                                     VSGTVGGQ--QGNKFNTVALDNGTTVKFLGNATFNGNTTIAANSTLQISGNYTADF-IAS
                                                                                 KTTTANGQTGQADKFETVT -- SGTKVTF -- - ASGNGTTATVSKDD -- - QGNITVKYDVNV
                                                                                                              PLAEINFGSKGA---RADTVLNVGEGVNLYATNITTTDANVGSF----VFNAGGKNI
                                                                                                                                         KRTEVKIGAKTSVIKEKDGKLVTGKG----KGENGSSTDEGEGLVTAKEVIDAVNKAGWRM
                                                                                                                                                                      --AINELVIGNNGSVQFAHNTYLITRTTNAAGQGKIIFNPVVNNNTTLAAGTNLGSAAN-
                                                                                                                                                                                                 KGVKTGSTTGQSENVDFV-RTY------DTVEFLSADTKTTTV----NVESKDNG
                                                                                                                                                                                                                               DCDLAIATDQTGVVDASSLTNAQTLTISG-TIGIIGANNTTLGQFNIGSSKTTLNGG-NV
                                                                                                                                                                                                                                                        AKETA-GTNGDPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNI
                                                                                                                                                                                                                                                                                     GDIGNGGGGAALQSITLANDATKTLTLGGANIISANGGTINFQANGGTIKLTSTQNNIVV
                                                                                                                                                                                                                                                                                                               GATVTLKAGDNLKIKQSGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNF
                                                                                                                                                                                                                                                                                                                                                                                                      LAAQVTVPDTMTLTGNFTGDANNPGNTAGVITFAANGTLASASADANVAVTNNITAIEAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                             160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S-layer; Cell wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   528
1656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of the gene encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1338
1656
533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   168097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   X
V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 196;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120 KDA SURFACE-EXPOSED 32 KDA BETA PEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  POLY-GLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3132A69C9DD5999F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the protein romp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            THIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A ROLE
DURING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BACTERIUM IS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROTEIN IS A MAJOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                               292;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AS A RICKETTSIAL INFECTION (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1656;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         W
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                               200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ВУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              commercial
                                                                                                                                                                                                                                                                                                                                                                                                      464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A S-
                                                                                                                                                                                                                                                                                                                                                                                                                                  63
  866
                                                          806
                                                                                   373
                                                                                                               749
                                                                                                                                          321
                                                                                                                                                                        999
                                                                                                                                                                                                   264
                                                                                                                                                                                                                               642
                                                                                                                                                                                                                                                          220
                                                                                                                                                                                                                                                                                     584
                                                                                                                                                                                                                                                                                                                  161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        way
```

35;

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                                                                              Stojiljkovic I., Valenti
"Salmonella typhimurium
Submitted (MAR-1999) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P25927; P25928; Q9XCQ3;
01-MAY-1992 (Rel. 22, Created)
01-MAR-2002 (Rel. 41, Last seguence update)
01-MAR-2002 (Rel. 41, Last annotation update)
            This SWISS-PROT entry is copyright. It is produced through a coperation of the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and for entitles requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                      MEDLINE-91100301; PubMed-1987123; Wu J.Y., Siegel L.M., Kredich N.M.; "High-level expression of Escherichia requirement for a cloned cysG plasmid
                                                                                                                                                                                                                                                                                                         McClelland M., Sanderson K.E., Spieth J., Cli
Courtney L., Porwollik S., Ali J., Dante M.,
Leonard S., Nguyen C., Scott K., Holmes A., C
Ryan E., Sun H., Florea L., Miller W., Stonek
Waterston R., Wilson R.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Putative surface-exposed virulence protein bigA BIGA OR STM3478. Salmonella typhimurium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1097
                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-LT2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BIGA_SALTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1047
                                                                                                                                                J. Bacteriol.
                                                                                                                                                            cofactor."
                                                                                                                                                                                                                                 STRAIN-LT2
                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                     Nature 413:852-856(2001)
                                                                                                                                                                                                                                                                                                                                                                           STRAIN-LT2 / SGSC1412 / ATCC 700720;
MEDLINE-21534948; PubMed-11677609;
                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-14028;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=602;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                      "Complete genome sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 867
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            419
                                                                                                                    in positions 414 and 732.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSNNGAGLKGNIYSQVIDFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ASGNSRG-----HFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NVRFADGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RAGIAQAIATAGLAQAYLPGKSMMAI-----GGGTYLGEAGYAIGYSSISDTGNWVIKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EG-----DVTNVAQLKGVAQNLNN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IGDQNNIVGLGLGSDNGIIVNATTLYAGIGTINNNQGTVTLSGGVPNTPGTVYGLGTGIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FENSSLGAVLFLPSGIPFNDAGNTIPLTIKSTVGNETAEGFSVPSVIVSGVDSVIADGQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          I-----NAGNNIEIT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       {\tt ASKFKQVTFTTDYNNLGNIIATNTTINDGVTVTTGGIAAGGIAGTDFDGKITLGSVNGNA}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --PQFSSVSLGAGAD----APTLSV---
                                                                                                                                                                                                                                            1-765
                                                                                                                                173:325-333(1991).
Ref.3 sequence differs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----FSNSTSMIVTTKANNGTVTYLGNA--FVGNIGDSDTPVASVRFT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                              Valentine P., Heffron F.;
imurium rhs homolog.";
999) to the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                           FROM N.A.
                                                                                                                                                                                                                                                                                              of Salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           581
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         subdivision; Enterobacteriaceae;
                                                                                                                                   from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1953
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -DDEGALNVGSKDANKPVRITNVAPGVK
                                                                                                                                                                          ť
                                                                                                                                                                                      coli NADPH-sulfite reductase:
                                                                                                                                                                                                                                                                                                                      s A., Grewa
Stoneking
                                                                                                                                                                                                                                                                                                                e M., Du F., Hou S., e M., Grewal N., Mulva
                                                                                                                                                                                                                                                                                             enterica serovar Typhimurium
                                                                                                                                                                          overcome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A
                                                                                                                                   that
                                                   ere are no restrictions as its content is in
                                                                                                                                  shown
                                                                                                                                                                                                                                                                                                                                                                                                                                  databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----RIDNVNGNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----RNGKNIDIATSMT
                                                                                                                                                                       limiting
                                                                                                                                  due
                                                                                                                                                                                                                                                                                                                                    Mulvaney
                                                                                                                                  ç
                                                                                                                                                                                                                                                                                                                                                  Latreille I
S., Layman
                                 for
                                                                                                                                   frameshifts
                                                                                                                                                                          siroheme
                                                                                collaboration
L outstation -
                          .ch/announce,
                                                                              outstation
                                                                                                                                                                                                                                                                                                                                     H
                                                                                                                                                                                                                                                                                                                                             P.,
D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           986
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      487
                                                    no
                                                                  on
```

```
Ωy
                                                                                                       Вþ
                                                                                                                                                              Ωy
                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                          Š
                              밁
                                              Ş
                                                                  В
                                                                                                                        QY
                                                                                                                                             망
                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 136
                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
REPEAT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; AF133696; AAD39458.1; --
EMBL; A5008899; AAL72340.1; --
EMBL; M54066; AAA77042.1; ALT_FRAME.
EMBL; M64606; AAA77043.1; ALT_FRAME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PIR; C39200; C39200.
PIR; D39200; D39200.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Virulence;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             StyGene;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
           480
                                               424
                                                                                     374
                                                                                                        600
                                                                                                                           321
                                                                                                                                              543
                                                                                                                                                                  271
                                                                                                                                                                                    490
                                                                                                                                                                                                       215
                                                                                                                                                                                                                          430
                                                                                                                                                                                                                                           161
                                                                                                                                                                                                                                                               391
                                                                                                                                                                                                                                                                                 101
                                                                                                                                                                                                                                                                                                    347
                                                                                                                                                                                                                                                                                                                        41 TLLSATVQANATDTDEDEELESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTL 100
TNVAPGVKEGDVTNVAQLKG---VAQNLNNRIDN---VNGN---ARAGIAQAI----
                              GNTVTLNGALNIDDNDLSATGGQYLDVVGLSVTGDDNDVEID-
                                                                                    GDALNVNQLQNSGWNLDSKAVAGSSGKV-ISGNVSPS
                                                                                                                                                                                                                          FAGDIAVSGGGTAIIIDGDNATIKNTGTSDISGAGSTGTVIDGNNARVNNDGDMTITDGG
                                                                                                                                                                                                                                                               DGATGMVISGDGTTNTISGH-----STVD-----NATGALISGNGTTTN
                                                                                                                                                                                                                                                                                 HGATVTLKAGDNLKIKQSGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLN
                                                                                                                                                                                                                                                                                                    TVISGDDQAH -- NSDRGMDISGQDRTGVII --
                                                NIEITRNGK-NI--
                                                                  ---VSVQDSEGVFSSATGVSVSGDSNAVDITGNVNISADYGQDDLAAGAPPLTGVVVGGN
                                                                                                       --KNTGNATVRDADSVGFVVAGEKNTFKNKGDIDVSLNGTGALVS-GDMSQVTLDGDINV
                                                                                                                         MKTTTANGQTGQADKFETVTSGTKVTF-----ASGNGTTATVSKDDQGNITVKYDVNV
                                                                                                                                              IDGDDAHTTNTGDIAVDGAGSAAVIINGDNGSLTQAGDLLVTDGAMGIITYGTGNEA---
                                                                                                                                                                 IGAKTSVIKEKDGKLVTGKG------KGENGSSTDEGEGLVT--AKEVI--DAVNKAGWR
                                                                                                                                                                                    TGGHITGDNVVIDNAGSTTVSGADA-----
                                                                                                                                                                                                       NAGW----NIKGVKTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVK
                                                                                                                                                                                                                                           FAKETAGTNGDPTVHLNGIGSTLTDT-----LAGSSASHVDAGNQSTHYTRAASIKDVL
                                                                                                                                                                                                                                                                                                                                           al Similarity
136; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SG10437; bigA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Repeat;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 156
167
178
189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       101
101
104
114
123
134
                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                          ΑĄ.
                                                                                                                                                                                                                                                                                                                                                                                                   1698
1798
1837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1953
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                              144
155
166
177
188
199
210
221
232
243
252
267
                                               DIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRI
                                                                                                                                                                                                                                                                                                                                                    6.5%;
22.0%;
                                                                                                                                                                                                                                                                                                                                                                                                 10.
11.
11.
12.
13.
14.
15 (INCOMPLETE).
15 (IN REF. 1).
17 (IN REF. 1).
18 (IN REF. 1).
19 (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                          200150
                                                                                                                                                                                                                                                                                                                                                                            96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Complete proteome POTENTIAL.
                                                                                                                                                                                                                                                                                                                                         Score 195.5;
Pred. No. 0.02
96; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15 X 11 AA TANDEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROTEIN BIGA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PUTATIVE SURFACE-EXPOSED VIRULENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (INCOMPLETE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (INCOMPLETE).
                                                                                                                                                                                     -TALYIEGDNALVINEGNQTISGGAVGTR
                                                                                                                                                                                                                                                                                                                                                    .02;
                                                                                                                                                                                                                                                                                                                                                              BB
                                                                                                                                                                                                                                                                                                                                           249;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEATS
                              -GGINI - -THSEDPLDG
                                                                                                                                                                                                                                                                                                    SGDRTVNTLTGDSSVT
                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                          CRC64;

    KGKMDETVNINAGN

                                                                                                                                                                                                                                                                                                                                                                                                                                         REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                        1).
                                                                                                                                                                                                                                                                                                                                                              1953;
                                                                                                                                                                                                                                                                                                                                           137;
          Ā
                                                                                                                                                                                                                                                                                                                                          Gaps
                                                 479
                                                                                     423
                                                                                                                                                                                                                          489
                                                                                                                                                                                                                                                               429
                                                                                                                                                                                                                                                                                  160
                                                                                                                                                                                                                                                                                                     390
           525
                              769
                                                                                                        656
                                                                                                                                              599
                                                                                                                                                                  320
                                                                                                                                                                                     542
                                                                                                                                                                                                        270
                                                                                                                                                                                                                                            214
                                                                                                                                                                                                                                                                                                                                           29;
```

```
RESULT 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вp
 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Aiba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Itoh T., Kasai H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T., Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T., "A 570-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 28.0-40.1 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                        Moszer I., Glaser P., Danchin A.;
"Multiple IS insertion sequences near the replication terminus
Escherichia coli K-12.";
Biochimie 73:1361-1374(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YDBA_ECOLI STANDARD; PRT; 2003 AA. P33665; P76087; P76089; P76856; P76857; P76859; 01-FEB-1994 (Rel. 28, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Hypothatical restrictions
EMBL;
EMBL;
                                                                                                        use by non-profit institutions as long modified and this statement is not removed. entities requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F. Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hypothetical protein ydbA. YDBA OR B1401/B1405.
                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE-92190338; PubMed-1665988;
                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-K12
                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 464-2003 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=97251357; PubMed=9097039;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-K12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=K12 / MG1655;
MEDLINE=97426617; PubMed=9278503;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          882
                                                                                                                                                                                                                                                     SIMILARITY: TO S.TYPHIMURIUM ORF NEAR CYSG (AC P25928), CAUTION: THIS IS A CONCEPTUAL TRANSLATION; THE GENE CODING THIS PROTEIN IS INTERRUPTED BY A HYBRID IS2D/IS30C ELEMENT BETWEEN AMINO ACIDS 839 AND 840.
                                                                                                                                                                              European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATSSNSSEDRAAITRASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTASGNSRGHFGTSASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VDVNVSYIPTGYYTYNALLMADGEGTSIENKGDITSHGVYSVIRADNGSEVSNSGDILVY 881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AGLAQAYLP-----GKSMMAIGGGTYLGEAG------YAI----GYSSISDTGNWVIK 568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TS-----ADITGIS-VSGNSTVTLNGHSTIDTNTVVGGHVVLARVNNGGSLILGDDSV
AE000237; AAC74483.1; ALT_SE
AE000237; AAC74487.1; ALT_SE
D90778; BAA15009.1; ALT_SEQ.
D90778; BAA18881.1; ALT_SEQ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3:363-377(1996).
                                                    AAC74483.1; ALT_SEQ.
AAC74487.1; ALT_SEQ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      subdivision; Enterobacteriaceae;
                                                                                                                          (See http://www.isb-sib.ch/announce/
                                                                                                                                                                          There
                                                                                                                                                             as its content
                                                                                                                                           Usage
                                                                                                                                                                              are no restrictions
                                                                                                                                             уd
                                                                                                                                               and
                                                                                                                                               for
                                                                                                                                             in no way
                                                                                                                                                                                                                                                                                          FOR
                                                                                                                                                                                                                                                                                                                                                                 ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ۷.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    821
```

HLYA AC DT DT DT DT DE GN OC

HPMA. Proteus mirabilis Bacteria; Proteob

Proteobacteria;

gamma

subdivision;

Enterobacteriaceae;

Hemolysin

HLYA\_PROMI P16466; 01-AUG-1990 01-AUG-1990 01-NOV-1990

(Rel. 15, Created) (Rel. 15, Last sequence (Rel. 16, Last annotation)

sequence u annotation

update)

RESULT

\_PROMI

STANDARD;

PRT;

```
Q
                                                                                                                                                                                                                                                                                                                                                                    ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QУ
                      Qy
                                                      В
                                                                              QΥ
                                                                                                               멍
                                                                                                                                        Ş
                                                                                                                                                                      В
                                                                                                                                                                                               Š
                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SQ FT
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EcoGene; EG11
Hypothetical |
CONFLICT 4
CONFLICT 4
SEQUENCE 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     185
                                                                                                                                                                                                 418
                                                                                                                                                                                                                                                                                                                                           436
                                                                                                                                                                                                                                                                                                                                                                                                  379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                160
                                                                                                                                                                       603
                                                                                                                                                                                                                             545
                                                                                                                                                                                                                                                                                     496
                                                                                                                                                                                                                                                                                                              314
                                                                                                                                                                                                                                                                                                                                                                       277
                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                          326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            150
768
                                                      720
                                                                                                                                           469
                                                                                                                                                                                                                                                         369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           41 TLLSATVQANATOTDEDEELESVARSALVLQFMIDKEGNG-EIESTGDIGWSIYYDDHNT
                                                                                                                                                                                              NINAGNNIEITRNGKNIDIATSM-TPQFSS-VSLGAGADAPTLSVDD-----EGALNV
                                                                                                                                                                                                                                                      YDVNVGDALNV----NQLQNSGWN--LDSK-----AVAGSSGKVISGNVSPSKGKMDETV
                                                                                                                                                                                                                                                                                                             VNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDD-----QGNITVK 368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   D----TLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VNITSDT----KG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LHGATVTLKAGDNLKIKQSGKDFTYSLKKELKDLTSVETE------KLSFGANGNK 149
                          TSASVGYQW
                                                                                                                                                                                                                                                                                                                                           TGTEIAGNNGKVIQDGDLDVSGGGHGIDITGDSATVDNKGTMTVTDPESIGIQIDGDQAI
                                                                                                                                                                                                                                                                                                                                                                 VIKE-----KDGKL-VTGKGKG---ENGSSTDEGEGLVTAKE-----VIDA----
                                                                                                                                                                                                                                                                                                                                                                                                  MTVTDPESIGIQVDGDQAVVNNEGESAITNGGTGTQINGDDATANNNGKTT----VDGKDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SVFTYTENADGTISLQD----
TSLRTGYSY 776
                                                      TSRQSNLFDGSAEKTSGLVVIGDG
                                                                                 AGLAQAYLPGKS-----MMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFG
                                                                                                                                          GSKDANKPVRITNVAPGVKEGDVTNVAQL---KGVAQNLNNRIDNVNGNARAGIAQAIAT
                                                                                                                                                                      S-NEATGFSITTNSGKVSLAGSMQVGDFSTGVDLNGNNNSVTLAAKDLKVVGQKATGINV
                                                                                                                                                                                                                              -- VNLDGSLTVTGGAHGVENIGDNGTVNNKGDIVVSDTGSIGVLINGEGATVSNTGDVNV
                                                                                                                                                                                                                                                                                     VNNEG---ESTITNGGTG----TQINGNDAT-ANNSGKTTVDGKDSTGTKIAGNIGI-
                                                                                                                                                                                                                                                                                                                                                                                                                              YDTVE----FLSADTKTTTVNVE------
                                                                                                                                                                                                                                                                                                                                                                                                                                                        NNGKTTVDGKDSTGTEINGNNGKVIQDGDL-DVSGGGHGI-----DITGDSATVDNKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDITGDSATVDNKGTMTVTDPESMGIQIDGDKAIVNNEGESTITNGGTGTQINGDDATAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --GELVI--TGDNATVNNNGKTTV----DGKDSTGTEINGNNGKVIQDGDLDVSGGGHG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         151;
                                                                                                               -SGDAN-TVNITGNVLVDKDKTADNAAEYFFDPSVGINVYGSDNNVTLDGKLTVVSDSEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    x62680; -; NOT_ANNOTATED_CDS ne; EG11307; ydbA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           495 4
2003 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           l protein; Complete proteome
489 489 I -> V (IN
495 495 I -> V (IN
2003 AA; 205949 MW; B83A129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                          589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -SNGRKATINLWQIDEANNTVALEGVSADGATKWQYNHN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ------LNFAKETAGTNGDPTVHLNGIGSTLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           > V (IN REF. 2).
> V (IN REF. 2).
B83A12C8B53220EE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ± 194;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 1.024;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         258;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 2003;
                                                                                                                                                                                                                                                                                                                                                                                                                               -SKDNGKRTEVKIGAKTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 172;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               184
                                                                                                                                             525
                                                                                                                                                                         661
                                                                                                                                                                                                   468
                                                                                                                                                                                                                                602
                                                                                                                                                                                                                                                          417
                                                                                                                                                                                                                                                                                     544
                                                                                                                                                                                                                                                                                                                                              495
                                                                                                                                                                                                                                                                                                                                                                        313
                                                                                                                                                                                                                                                                                                                                                                                                    435
                                                                                                                                                                                                                                                                                                                                                                                                                               276
                                                                                                                                                                                                                                                                                                                                                                                                                                                          378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         36;
```

```
QΥ
                                                                                                                                                                                        밁
                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                           Ŷ
                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                               밁
                                                                                           Ş
                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Uphoff T.S., Welch R.A.;
Uphoff T.S., Welch R.A.;
"Nucleotide sequencing of the Proteus mirabilis calcium-independent hemolysin genes (hpmA and hpmB) reveals sequence similarity with the Serratia marcescens hemolysin genes (shlA and shlB).";
J. Bacteriol. 172:1206-1216(1990).

-i- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD OFFIL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the European Bioinformatics Institute. There are no rest
use by non-profit institutions as long as its content
modified and this statement is not removed. Usage by ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A., AND SEQUENCE STRAIN=ISOLATE 477-12;
MEDLINE=90170827; PubMed=2407716;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 or send an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; M30186; AAA25657.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hemolysis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=584;
                              340
                                                                                                                                                                                                                                                                                                                                                                                654
   995
                                                               935
                                                                                              294
                                                                                                                           876
                                                                                                                                                         259
                                                                                                                                                                                        825
                                                                                                                                                                                                                       213
                                                                                                                                                                                                                                                      765
                                                                                                                                                                                                                                                                                     183
                                                                                                                                                                                                                                                                                                                  710
                                                                                                                                                                                                                                                                                                                                                 130
                                                                                                                                                                                                                                                                                                                                                                                                                                              607
                                                                                                                                                                                                                                                                                                                                                                                                             75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FUNCTION: CELL-BOUND HEMOLYSIN, WHICH ERYTHROCYTES BY INTERACTION WITH THE E REQUIRES HPMB FUNCTION: Outer membrane.
MISCELLAUROUS: THE CONSERVED AMPHIPATH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MISCELLANEOUS: THE CONSERVED AMPHIPATHIC DOMAINS MAY BE RESPONSIBLE FOR PORE FORMATION.
SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A35140;
                                                                                                                                                                                                                     VLNAG--WNIKGVKTGSTTGQSENVDFVRTYDTVEFLSADTKTTTVNV-------
                                                                                                                                                                                                                                                                                                                                                                             DKLG---IHSLGDINVKSAQQVTKIDDEKTSLAITGHAKEVED-KQYSAGFHITHTTNKN
                                                                                                                                                                                                                                                                                                                                                                                                                                          AFNITKSSHKNETNKQTST-----GSELISDAQLTVVSGNDVNVIGSLIKSA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SWISS-PROT entry is copyright. It is produced through a cen the Swiss Institute of Bioinformatics and the EMBL
FHETKGGGQIGVSTKTGSDITVAIKGEGQTT---
                             TSGTK----VTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGW--NLDSKA
                                                                                                                        VTKPVKKAIEDGVNT-TKPGNNTDLTKKVTARDAIANLANLSNLETPNVGVEVGIKGGGS
                                                                                                                                                                                        LLHEGASHHVEGRYQES----GENIQHLAVND----SETSKTDSLNVGIDVGVNLDYSG
                                                                                                                                                                                                                                                    QTDNTDTT I SGGFSYTGGVDKVGSKADFQYDKQHTQTEVTKNRGSQTEVAGDLT I TANKD
                                                                                                                                                                                                                                                                                                                                              LKDLTSVETEKLSFGANGNKVNITSDTKGLNFA----KETAGT----NGDPTVHLNGIGST
                                                                                                                                                                                                                                                                                                                                                                                                           DKEGNGEIESTGDIGWS-----IYYDDHNTLHGATVTLKAGDNLKIKQSGKDFTYSLKKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEELESVARSALVLQFMI 74
                                                             QQSQTDSQAVSTSINAGKIDIDSNNKLHDQGTHYQSTQEGISLTANTHTSEATLDKHQTT
                                                                                           NGSSTDE---GEGLVTAKEVIDAVNK---AGWRMKTT-----TANGQTGQA--DKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                TSTETEQANSTISGANVDLQAN-KDVTFAGSDLKTTAGNASITGDNVAFVSTENKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30 15
1577 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Toxin; Outer membrane; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 email to license@isb-sib.ch).
                                                                                                                                                         ESKDNGKRTEVKIGAKTSVIKE --- KD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A35140.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     165869 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF
                                                                                                                                                                                                                                                                                 AGSSAS-HVDAGNQSTHYTR------AASIKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 188.5;
Pred. No. 0.(
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HEMOLYSIN.
4W; 175975E0C924B2D9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          There are no restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .034;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RELEASES HEME-IRON ERYTHROCYTE MEMBRANI
 -DNALMETKAKGSQFTSNGDISI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        244;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEMBRANE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IN
                                                                                                                                                         GKLVTGKGKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SHLA AND HPMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        215;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                764
                                                                                                                                                                                                                                                                                                                                                                                                           129
                                                                                                                                                                                                                                                                                                                                                                                                                                            653
                                                                                                                          934
                                                                                                                                                                                      875
                                                                                                                                                                                                                                                  824
                                                                                                                                                                                                                                                                                                                                              182
                                                                                                                                                                                                                                                                                                                                                                              709
                                                                                                                                                         293
                                                                                                                                                                                                                                                                                 212
                                                                                                                                                                                                                       258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            on
o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       40;
```

```
RESULT 11
YPJA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Science
[2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Blattner F.R., Piunkett G. III, Bloch C.A., Perna N.T., Burland Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F. Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Mau B., Shao Y.,
"The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              p52143; p76610; p77017; p77019;
01-0CT-1996 (Rel. 34, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Hypothetical outer membrane protein ypjA.
                                                EMBL;
                                                                                EMBL;
                                                                                                                                                                                                                                                                                                                                                                             Yamamoto Y., Aiba H., Baba T., Hayashi K., Inada T., Isono K., Itoh T., Kinura S., Kitagawa M., Makino K., Miki T., Mitsuhashi N., Mizobuchi K., Mori H., Nakade S., Nakamura Y., Nashimoto H., Oshima T., Oyama S., Saito N., Sampei G., Satoh Y., Sivasundaram S. Tagami H., Takahashi H., Takeda J., Takemoto K., Uehara K., Wada C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1102
                                                                                                                                                             the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                          Yamagata S., Horiuchi T.;
"Construction of a contiguous 874-kb sequence of the Escher"
- K12 genome corresponding to 50.0-68.8 min on the linkage
analysis of its sequence features.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=K12 / MG1655;
MEDLINE=97426617; PubMed=9278503;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1048
Hypothetical protein; SEQUENCE 1569 AA;
                                                                                                                             entities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Escherichia
                              EcoGene; EG13213; ypjA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=97349980; PubMed=9205837;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Escherichia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YPJA OR B2647.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YPJA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   394
                                                                                                                                                                                                                                                              SUBCELLULAR LOCATION: Outer membrane (Potential). SIMILARITY: STRONG, TO BORDETELLA PERTACTIN.
                                                                                                                                                                                                                                                                                                Res. 4:91-113(1997)
                                                                                                                                                                                                             SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  G---LGSAQFAIGKQDEKSVSREGGTINNSGNLTINGNSVHLQGAQVNSKDTQLTSQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VAQNLNNRID-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NVGENAHYEGAQFDAQKGK---TV-INAGGDLTLAQATDTHSESQSNVNGSANLKVGT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGTYLGEAGYAIGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IALNATNKVDLQSASSEHTEKGNNLSGGVQAGF-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TPE--SKDYGGGFNAGTTHHSKEQTTAKVGTITGSQGIELNAGHNLTLQG--THLSSEQD 1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TPQFSSVSLGAGADAPTL-SVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKG
                                                                                                U36840; AAA79815.1; ALT_SEQ
                                            AE000350; AAC75695.1; -. D90889; BAA16514.1; ALT_INIT D90890; BAA16518.1; ALT_INIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Proteobacteria; gamma subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    coli.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
162774 MW; 0D006A9A32154596 CRC64.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -NVNGNARAGIAQAIATAGLAQAYLPGKSM----MAIG 542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -SSISDTGNWVIKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1569
                                                                                                                                                                                                There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   æ
                                                                                                                                                                               as its content
                                                                                                                                                               Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----GKKMTDDASSVN 1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -ASGNSRGHFGTSAS
                                                                                                                                                                                                                                                                                                                                                  Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGK-NIDIATSM
                                                                                                                                                                                              restrictions
                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                map
                                                                                                                                                .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                               C:,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    499
                                                                                                                                                                                                ဝ္ဂ
                                                                                                                                                                                no
                                                                                                                                                                                way
```

```
RESULT 12
120K_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local S
Matches 149
                                                                                                                                                                                                      120K_RICRI
P14914;
01-APR-1990
01-FEB-1996
01-MAR-2002
                                                                                                                                                                                                                                                                                                                                                                 1189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1021
                                                                                                                    Bacteria; Proteobacteria;
Rickettsiaceae; Rickettsi
                MEDLINE=90136087; PubMed=2515418; Gilmore R.D. Jr., Joste N., McDonald
                                                                                                    NCBI_TaxID=783;
                                                                                                                                                         Rickettsia
"Cloning,
                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              581
                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                860
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7 Match 6.3%;
Local Similarity 21.4%;
nes 149; Conservative 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            77
                                                                                                                                                                                         kDa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SVET-EKLSFGANGNKVNITSDTKGL-NFAKETAGTNGDPTVHLNGIGSTLTDTLAGSSA 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INANGKMDVYGKDVGTVLNSAGTQTIYASATSDKA--NIK---GGKQTVYGLATE----A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HVEQQSGGALIASTTSGTLIEGTNSYGDAFYIRNSEAKNVVLENAGSLTVVTGSRAVDTI 640
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HTKRAS - - ATVATAVLATLLSATVQANATDTDEDEELESV - - - - ARSALVL - - QFMIDK -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTLADASVSGATGSLSLMTPRDNVTPVKLEGAVRITDSATLTLGNGVDTTLADLTAASRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GKNIDIATS-----MTPQ------FSSVSLGAGADA--PTLSVDDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GAALQTSTANG-----IEISGTHQYGTFSISGNLATNMLLENGGNLLVLAGTEARD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GWRMKTTTANGQTGQADKFETVTSGTKV--TFASGNGTTATVSKDDQGNI----TVKYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGEQIVEGVANETTINDGGIQTVSANGEAIKTKINEGGTLTVNDNGKAT-----DIVQNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TRADGVAFSIEQGAANNILLANGGVLTVESDTSSDKTQVNMGGR-EIVKTKATATGTTLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --YDTVEFLSADTKTTTV-----NVESKDNGKRTEVKIGAKTSVIKEK------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NIESGEQIVDGGSTEKTHINGGTQTVQNYGK---AINTD-----IVSGLQQIMANGTA
                                                                                                                                                                                                                                                                                                                                                                                                   LGEAGYAIGYSSISDTGNWVIKGT ---- ASGNS 575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVWLNSNNSCAGTSNCEYRVNSLL--LNDGDVYLSAQTAAPATTNGIYNTLTTNELSGSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ALNVGSKD-----ANKPVRITNVAPGVKEGDV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STVGKG----GAMQNLG--QDSATKVNSGGQYTLGRSKDEFQALARAEDLQVAGGTATVYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EGSIINGGSQVVNEGGLAE-NSVLNDGGTLDVREKGSATGIQQSSQGALVATTRATRVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    --SHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTG--QSENVDFVRT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -EGNGEIESTG-DIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGKDFTYSLKKELKDLT
                                                                                                                                                                                                                                                                                                                                                                 -GDASFTLG----NTGGFVDLGTYEYVLKSDGNS 1217
                                                                                                                                                                                                                                                                                                                                                                                                                                  NFYLHTNVAGSRGDQLVVNN---NATGNFKI----FVQDTGVSPQSDDAMTLVKTGG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----TNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMAIGGGTY
                                                                                                                                                                                         surface-exposed
expression
                                                                                                                                                         rickettsii.
                                                                                                                                                                                                        (Rel. 14, Created)
(Rel. 33, Last sequence update)
(Rel. 41, Last annotation updat
                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                       Rickettsieae;
                                                                                                                                                                                                                                          14, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---DGKLVTGKGKG-----
                                                                                                                                                                                           protein.
 sequence
                                                                                                                     alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 187.5; DB 1;
Pred. No. 0.038;
4; Mismatches 249;
                                                                                                                                                                                                                                                                               PRT;
ald G.A.;
analysis
                                                                                                                                                                                                                                                                             1300
                                                                                                                                                                                                           update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENGSSTDEGEGLVTAKEVIDAVNKA
                                                                                                                                                                                                                                                                             A
   of
                                                                                                                                         Rickettsiales;
   the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
 gene
   encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                203;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                37;
```

Ş

밁 δÃ

Š 밁 Š 망

밁 80 밁 В Qy 망 ρy 망 Ş В δÃ В οy 밁 Q В 9

```
Q
                                     밁
                                                    δÃ
                                                                          밁
                                                                                         20
밁
                                                                                                                      Query Match
Best Local
                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                        CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                   CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120
Mol.
                                                                                                                                                                   CARBOHYD
CARBOHYD
                                                                                                                                                                                      CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                     CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      InterPro; IPR003858; rOmpA_rOmpB
Pfam; PF02708; rOmpA_rOmpB; 1.
Antigen; Glycoprotein; Cell wall
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           use by non-profit institutions as long as its content modified and this statement is not removed. Usage by an entitles requires a license agreement (See http://www.isborsend an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; X16353; CAA34402.1; -. PIR; S07575; S07575.
                                                                                                                                                                                                                                                                                                                     CARBOHYD
                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                          CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                     CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                          CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                     CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                             CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONFERRING ANTIGENICITY TO THE PROTEIN.
-!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                           SEQUENCE
                                                                                                                                                                                                         CARBOHYD
                                                                                                                                                                                                                 CARBOHYD
                                                                                                                                                                                                                            CARBOHYD
                                                                                                                                                                                                                                    CARBOHYD
                                                                                                                                                                                                                                             CARBOHYD
                                                                                                                                                                                                                                                                                           CARBOHYD
                   147
                                     76
                                                       87
                                                                          22
                                                                                           30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       kD surface-exposed protein of Rickettsia rickettsii.";
Microbiol. 3:1579-1586(1989).
FUNCTION: MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS
RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION
SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MISCELLANEOUS: ITS C-TERMINUS POTENTIALLY MAY BEAR THE EPITOPES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                           ASATVATAVLATLLSATVQANATDTDEDEELESV-ARSALVLQFMIDKEGN--GEIESTG
GAGVVQLSGTHAAELRLGNAGSIFKLADGTV-INGKVNQTALVGGALAAGTITLDGSATI 169
                 GNKVNITSDTKGLNFAKETAGT---NGDPTVHLNG-----IGSTL---TDTLAGSSAS 193
                                                     DIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGKDFTYSLKKELKDLTSVETEKLSFGAN 146
                                      NTAGVITEDANGTLESAS----ADANVAV-----
                                                                           ADGTTAFKTAASKYTITQDSNFGNTDFGNLAAQIKVPNAITL----TGNFTGDASNPG
                                                                                                                      Similarity
                                                                                                                                                           Conservative
                                                                                                                                                           AA;
                                                                                                                                                                     \frac{1146}{1211}
                                                                                                                      6.2%;
                                                                                                                                                                                                                                                                                                                                                          103
147
268
330
375
415
424
                                                                                                                                                            132801
                                                                                                                88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1.
wall;
                                                                                                                                                            ₹.
                                                                                                                                                                                                                                                                                                                              N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                   N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                               N-LINKED
N-LINKED
N-LINKED
N-LINKED
                                                                                                             Score 186.5; DB Pred. No. 0.034; 8; Mismatches 2
                                                                                                                                                                                                                                                                                 N-LINKED
                                                                                                                                                                                                                                                                                                             N-LINKED
                                                                                                                                                                   N-LINKED
N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                N-LINKED
                                                                                                                                                                                                                                             N-LINKED
                                                                                                                                                                                                                                                                                                      N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                           N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                     N-LINKED
                                                                                                                                                                                                                            N-LINKED
                                                                                                                                                                                                                                      N-LINKED
                                                                                                                                                                                                                   N-LINKED
                                                                                                                                                           [NKED (POTENTIAL).
E09E52C3F647243D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       s-layer
                                                                                                                                                                            (POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                  (POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                          (POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                                                                                                                               (POTENTIAL)
(POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                   (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                     (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                          (POTENTIAL)
                                                                                                                                                                                                                                                                                                     (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                          (POTENTIAL)
                                                                                                                                                                                                                                                               (POTENTIAL)
                                                                                                                                                                                                                                                                                  (POTENTIAL)
                                                                                                                                                                                                                                                                                                                       (POTENTIAL)
                                                                                                                                DB 1;
                                                                                                                260;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               rickettsii.";
                                      -TNNITAIE---
                                                                                                                               Length
                                                                                                                Indels
                                                                                                                                                            CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                  1300;
                                                                                                                261;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ıπ
                                      AS
                                                                                                               Gaps
                                       110
                                                                           75
                                                                                             86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           way
                                                                                                                38;
```

```
δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 말
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         đ
                                                                                                                                                                                                                                                                                                                                                                      OMPB_RICRI
Q53047;
30-MAY-2000
                                                                                                                                                                                                                                                                              30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer pro
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (ro
(rOmp B) (Contains: 120 kDa surface-exposed protein (Surface
antigen) (120 kDa outer membrane protein ompB); 32 kDa beta p
                                                                                  MEDLINE=92167802; PubMed=1724278; Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., F. Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., F. "The 120 kilodalton outer membrane protein (romp B) rickettsii is encoded by an unusually long open reacevidence for protein processing from a large precurs open Microbiol. 5:2361-2370(1991).
 MEDLINE=90136087;
Gilmore R.D. Jr.,
"Cloning, expressi
                                                                                                                                                                                                               Rickettsiaceae;
NCBI_TaxID=783;
                                                          SEQUENCE OF
                                                                                                                                                                          STRAIN=R;
                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                              Bacteria; Proteobacteria; alpl
Rickettsiaceae; Rickettsieae;
                                                                                                                                                                                                                                                           Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TKANNGTVTYLGNA--FVGNIGDSDTPVASVRFTGSDSGAGLQGNIYSQVIDFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PFNDAGNTMPLTIKSTYGNKTAKGFDYPSYYVLGYDSYIADGQYIGDQNNIYGLGLGSDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VTLNKQAAPVNALKQITVSGPGNVVINEIGNAGNHHGAVTDTIAFENSSLGAVVFLPRGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WNLDSKA-----VAGSSGKVIS--GNVSPSKGKMDETVNI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TGDIGNAGGAAALQRITLANDAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTSTQNNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HVDAGNQS----THYTRAASIKDVLN-AGWNIKGVKTGSTTGQSEN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GNIIATNATINDGVTVTTGGIAGIGFDGKITLGSVNGNGNVRFADGILSNSTS---MIGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GIIVNATTLYAGISTLNNNQGTVTLSGGVPNTPGTVYGLGTGIGASKFKQVTFTTDYNNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----APTLSV-----DDEGALNVGSKDANKPVRITNVAPG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TVALENGTTVKFLGNATFNGNTTIAANSTLQIGGNYTADC-VASADGTGIVEFVNTGPIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INFGSKGVNVDTVLNVGEGVNLYATNITTTDANVGSFVFNAGGTNIVSGTVGGQQGNKFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INELVIGNDGAVQFAHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAAGTNLGSATNPLAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RTEVKIGAKTSVIKEKDGKLVT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VDFDLAIATDQTGVVDASSLTNAQTLTINGKIGTIGANNKTLGQFNIGSSKTVLSNGNVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VDF - - - VRTYDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -NAGNNIEIT----
    expression
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EGEGLVTAKEVIDAVNKAGWRMKTTTAN-----
                                                                                                                                                                                                                                                          rickettsii.
                                                          279-1654 FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -VKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGK
                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
PubMed=2515418;
Joste N., McDonald G.A.;
ion and sequence analysis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -ASGNGTTATVSKDD---QGNITVKYDVNVGDALNVNQLQNSG---
                                                                                                                                                                                                                              alpha subdivision;
eae; Rickettsia.
                                                          N.A.
                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GKGK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -VEFLSADTKT-
                                                                                                                                                                                                                                                                                                                                                                                                  1654
                                                                                                                                                                                                                                                                                                                          kDa surface-layer protein)
                                                                                                                                                                                                                                                                                                                                                                                                  B
    of
                                                                                                 precursor
                                                                                                                                                                                                                                            Rickettsiales;
  the
                                                                                                               reading
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----GQTG--QADKFE
  gene
                                                                                                                             Hackstadt T.;
) of Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -PQFSSVSLGAGAD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GEN-GSSTD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----HFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -TTVNVESKDNGK
  encoding
                                                                                                               frame:
                                                                                                                                                                                                                                                                                                             (rOmpB)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  581
                                                                                                                                                                                                                                                                                                 protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             265
```

```
Š
                                                                    멍
                                                                                                             δÃ
                                                                                                                                                              В
                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                               뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SQUETTE WAR TO COLOR COL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120 J
Mol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     entities requires a license agreement (See http://www.isb-sib.ch/announce, or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Antigen; S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             430
                        455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            376
                                                                                                                                                                823
                                                                                                                                                                                                          387
                                                                                                                                                                                                                                                        764
                                                                                                                                                                                                                                                                                                                                                     704
                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                               644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   kD surface-exposed protein of Rickettsia rickettsii, Microbiol, 3:1579-1586(1989).
FUNCTION: THE 120 kDa SURFACE-EXPOSED PROTEIN IS A STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKE VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION. SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sWISS-PROT entry is copyright. It is produced through
ween the Swiss Institute of Bioinformatics and the EN
European Bioinformatics Institute. There are no restr
by non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LAYER WITH HEXAGONAL SYMMETRY. SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                               WNLDSKA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VDFDLAIATDQTGVVDASSLTNAQTLTINGKIGTIGANNKTLGQFNIGSSKTVLSNGNVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TGDIGNAGGAAALQRITLANDAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTSTQNNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HVDAGNQS----THYTRAASIKDVLN-AGWNIKGVKTGSTTGQSEN------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GNKVNITSDTKGLNFAKETAGT---NGDPTVHLNG-----IGSTL---TDTLAGSSAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NTAGVITFDANGTLESAS----ADANVAV------TNNITAIE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGKDFTYSLKKELKDLTSVETEKLSFGAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADGTTAFKTAASKVTITQDSNFGNTDFGNLAAQIKVPNAITL----TGNFTGDASNPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ASATVATAVLATLLSATVQANATDTDEDEELESV-ARSALVLQFMIDKEGN--GEIESTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    X16353; CAA34403.1; -. Pro; IPR003858; rOmpA_rOmpB. PF02708; rOmpA_rOmpB; 1.
                                                                    PFNDAGNTMPLTIKSTVGNKTAKGFDVPSVVVLGVDSVIADGQVIGDQNNIVGLGLGSDN
                                                                                                                                                                VTLNKQAAPVNALKQITVSGPGNVVINEIGNAGNHHGAVTDTIAFENSSLGAVVFLPRGI
                                                                                                                                                                                                                                                        TVALENGTTVKFLGNATFNGNTTIAANSTLQIGGNYTADC-VASADGTGIVEFVNTGPIT
                                                                                                                                                                                                                                                                                                    TVT--SGTKVTF---ASGNGTTATVSKDD---QGNITVKYDVNVGDALNVNQLQNSG---
                                                                                                                                                                                                                                                                                                                                                     INFGSKGVNVDTVLNVGEGVNLYATNITTTDANVGSFVFNAGGTNIVSGTVGGQQGNKFN
                                                                                                                                                                                                                                                                                                                                                                                                                                               INELVIGNDGAVQFAHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAAGTNLGSATNPLAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RTEVKIGAKTSVIKEKDGKLVT----GKGK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VDF - - - VRTYDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAGVVQLSGTHAAELRLGNAGSIFKLADGTV-INGKVNQTALVGGALAAGTITLDGSATI 523
                                                                                                                  NAGNNIEIT
-APTLSV--
                                                                                                                                                                                                                                                                                                                                                                                                   EGEGLVTAKEVIDAVNKAGWRMKTTTAN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Cell wall.
1333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \frac{1654}{1188}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         168184
DDEGALNVGSKDANKPVRITNVAPG
                                                                                                                                                                                                          VAGSSGKVIS--GNVSPSKGKMDETVNI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 186.5; DB
Pred. No. 0.045;
8; Mismatches 26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120 KDA SURF
32 KDA BETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               POLY-THR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         D7AB70FB7087F618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -VEFLSADTKT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SURFACE-EXPOSED
BETA PEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      260;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             rickettsii.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IS A MAJOR
RICKETTSIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                  PQFSSVSLGAGAD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GEN-GSSTD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -TTVNVESKDNGK
                                                                                                                                                                                                                                                                                                                                                                                                   -GQTG--QADKFE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      261;
                                                                                                                                                                                                               -----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a collaboration
MBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -AS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ВΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    n no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Þ
                                                                      942
                                                                                                                                                                882
                                                                                                                                                                                                                                                           822
                                                                                                                                                                                                                                                                                                       386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        86
                                                                                                                     454
                                                                                                                                                                                                            419
                                                                                                                                                                                                                                                                                                                                                     763
                                                                                                                                                                                                                                                                                                                                                                                                   337
                                                                                                                                                                                                                                                                                                                                                                                                                                               703
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      38;
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OMPA_RICCN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
             between the Swiss Institute of Bioinformat
the European Bioinformatics Institute. The
use by non-profit institutions as lost
modified and this statement is not removed.
entities requires a license agreement (See
or send an email to license@isb-sib.ch).
                                                                                                           This
                                                                                                                                                                                  of the outer surface protein rOmpA.";
Submitted (DEC-1996) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: ELICITS PROTECTIVE IMMUNITY (BY SIMILARITY).
-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED
                                                                                                                                                                                                                                                  STRAIN-Indian tick typhus, M1, Malish 7, Raoult D., Fournier P.E., Roux V.; "Phylogenetic analysis of spotted fever
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=21442074; PubMed=11557893;
Ogata H., Audic S., Renesto-Audiffren P.,
Samson D., Roux V., Cossart P., Weissenbac
Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
01-MAR-2002 (Rel. 41, Last annotation update)
Outer membrane protein A precursor (190 kDa antigen) (Cell surface antigen) (rOmpA) (rOmp A).
                                                                                                                                                                                                                                                                                                                                                  "Differentiation of spotted fever group rickettsiae by sequencing and analysis of restriction fragment length polymorphism of PCR-amplified DNA of the gene encoding the protein rOmpA.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Crocquet-Valdes P.A., Weiss K., Walker D.H.;
"Sequence analysis of the 190-kDa antigen-encoding conoril (Malish 7 strain).";
Gene 140:115-119(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q52657; P95591;
Q52670; Q52674;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1003
                                                                                                                                                                                                                                                                                                                                     J. Clin.
                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=Indian tick typhus, M1, Mal MEDLINE=97015921; PubMed=8862558; Roux V., Fournier P.E., Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-Indian
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM STRAIN-Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria; alpha subdivision; Rickettsiales; Rickettslaceae; Rickettsleae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rickettsia conorii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1060 TKANNGTVTYLGNA--FVGNIGDSDTPVASVRFTGSDSGAGLQGNIYSQVIDFGT 1112
                                                                                                                                                                                                                                                                                                    SEQUENCE OF 953-2012 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OMPA_RICCN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE-94171067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mechanisms of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            537
                                                                                                                                         PTM: GLYCOSYLATED (BY SIMILARITY).
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                        S-LAYER WITH HEXAGONAL SYMMETRY
                                                                        SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRG-------HFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNIIATNATINDGVTVTTGGIAGIGFDGKITLGSVNGNGNVRFADGILSNSTS---MIGT 1059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GIIVNATTLYAGISTLNNNQGTVTLSGGVPNTPGTVYGLGTGIGASKFKQVTFTTDYNNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                               OF 8-204
                                                                                                                                                                                                                                                                                                                                     Microbiol. 34:2058-2065(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -VKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGK 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD; 
; P95592; 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               evolution in Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                               FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PubMed=8125327;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P95593;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT; 2021 AA.
3; P95594; Q52667;
                                                                                                                                                                                                                                                                                     Malish 7, and Moroccan;
                                                                                                                                                                                                                                                                                                                                                                                                                                Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Weissenbach
                                                                                                                                                                                                                                                                                                                                                                                                                                7,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               conorii
                                                                                                                                                                                                                                                    group rickettsiae
                                                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Fournier P.-E.,
ch J., Claverie
                                                         as its content
                             http://www.isb-sib.ch/announce/
                                            Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                 Moroccan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q52668; Q52669;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene of Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R. prowazekii."
                                              bу
                                               and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              J.-M.,
                                                                                                                                                                                                                                                      Λq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Barbe
                                          for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           581
                                                                                                                                                                                                                                                      study
                                                              'n
                                                                                                                                                                                        ВΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              <
:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1002
```

```
δÃ
                          Ъ
                                                                                          Query Match
Best Local
                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; U43794; AAB49549.1; --
EMBL; U43798; AAB495510.1; --
EMBL; U43806; AAB49551.1; --
EMBL; U45244; AAB49566.1; --
EMBL; U46918; AAA86663.1; --
EMBL; U83440; AAC35176.1; --
EMBL; U83443; AAC35184.1; --
EMBL; U83448; AAC35184.1; --
EMBL; U83448; AAC35189.1; --
                                                                                                                                                                                                                                                                                                                                                                                                     Complete
SIGNAL
                                                                                        CONFLICT
CONFLICT
SEQUENCE
                                                                                                                     CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                              CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                   VARIANT
CONFLICT
CONFLICT
                                                                                                                                                        CONFLICT
                                                                                                                                                                      CONFLICT
                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                             CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                          InterPro; IPR003858; rOmpA_rOmpB.
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                              CONFLICT
                                                                                                                                                  CONFLICT
                                                                                                                                                                                     CONFLICT
                                                                                                                                                                                           CONFLICT
                                                                                                                                                                                                                        CONFLICT
                                                                                                                                                                                                                                                   CONFLICT
                                                                                                                                                                                                                                                                 CONFLICT
                                                                                                                                                                                                                                                                                      CONFLICT
                                                                                                                                                                                                                                                                                            CONFLICT
                                                                                                                                                                                                                                                                                                                         VARIANT
                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                           VARIANT
                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                         VARIANT
                                                                                                                                                                                                                                                                                                                                                                                 DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                       DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                    Antigen;
                                                                                                                                                                                                                                                                                                                                             VARIANT
                                                                                                                                                                                                                                                                                                                                                     VARIANT
909
                           850
             68
                                         10
VVVTGAIDNTGNANNGIVTFTGDSTVTGNIG-----NTNALATVNVGAGVTLQAGGSLD
            LVLQFMIDKEGN------GEIESTGDIGWSIYYDDHNTLH----GATVTLKAGDNL- 113
                                         NSALNAWYVVSELTRN-HTKRASATVAT-AVLATLLSATVQANATDTDEDEELESVARSA
                           NNGIVTFTGDSTVTGNIGNTNALATISVGAGKATLGGAIIKATTTKLTDNASAVTFT-NP
                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                            proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                   Repeat;
                                                                                                                                                                                                                                                                                                                                       39
238
1424
60
76
86
86
126
126
1245
                                                                                          10
92
126
137
157
368
374
                                                                                                                                                                                                                               640
669
793
803
                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAA17405.1;
                                                                                          AA;
                                                                                                                                                                                                                                                                                                                                                                                                                  Signal;
                                                                                                                                                                                                                                                                                                                                     38
2021
946
1528
60
76
137
133
133
954
                                                                                                       985
1009
1013
11182
1314
1451
1624
1628
1875
1875
1875
                                                                                                                                                                                                                                                                 1308
1877
10
92
126
137
157
157
369
388
                                                             6.2%;
                                                                                          203328
                                                                                                                                                                                                                                                                                                                                                                                                                  oB; 1.
Cell wall; S-layer;
                                                      84;
                                                                                         MTAPLP
G -> R
MW; 327
                                                     Score 186.5;
Pred. No. 0.05
84; Mismatches
                                                                                                                                                                                                                                                                G -> D (IN REF.
IS -> VN (IN REF
KATLGGAIIKATTTK
                                                                                                                                                                                                                                                                             H V F C
                                                                                                                             H A E G H N X Y L
                                                                                                                                                                                           N ->
                                                                                                                                                                                                          REF.
                                                                                                                                                                                                                                             V N
                                                                                                                                                                                                                                                          REF.
                                                                                                                                                                                                                                                                                                   N -> H (IN STRAIN MOROCCAN).
N -> I (IN STRAIN INDIAN TICK
Q -> K (IN REF. 1).
I -> V (IN REF. 1).
                                                                                                                                                                                                                                                                                                                               MISSING (IN STRAIN M1).

MISSING (IN STRAIN MOROCCAN).

VT -> II (IN STRAIN INDIAN TICK TYPHUS).

D -> A (IN STRAINS INDIAN TICK TYPHUS, M1

AND MOROCCAN).
                                                                                                                                                                                                    ъÞ
                                                                                                                                                                                                                                                                                                                                                                                       OUTER MEMBRANE
THR-RICH.
                                                                                                                                                                                                                       LLRVQGGVVKSNTIN ->
                                                                                                                                                                                                                                     v
                                                                                                                                                                                                                                                                                                                                                                   V
                                                                                                                                                                                                   v
                                                                                          R (IN REF. 1).
327FC42D7CB24668
                                                                                                                                                                                                                                     DН
                                                                                                                                                                                                                                                                              UZ
                                                                                                              ×
                                                                                                                             ש
                                                                                                                                                        Z K O O O X Z
                                                                                                                                                                                                                                                   Þ
                                                                                                                                                                                                                                                                                                                                                                         NN (IN STRAIN INDIAN TICK TYPHUS).
                                                                                                                      Ę
                                                                                                                                                                                                                               SI
                                                                                                                                                                                                                                                                       7 (IN REF. 1).
[ (IN REF. 1).
] (IN REF. 1).
] (IN REF. 1).
] (IN REF. 1).
] (IN REF. 1).
                                                                                                                                                                                                                                     O N I N
                                                                                                                            NII)
NII)
NII)
NII)
NII)
NII)
                                                                                                 'IN REF. 1)
                                                                                                               (IN REF. 1)
                                                                                                                                                                                                                                                                                                                                                                  (IN STRAIN INDIAN TICK TYPHUS).
                                                                                                                  N REF. 1).
N REF. 1).
N REF. 1).
N REF. 1).
N REF. 1).
N REF. 1).
N REF. 4).
N REF. 1).
                                                                                                                                                                                                                              IN REF. 1
IN REF. 1
IN REF. 1
                                                      ; DB 1;
0.057;
les 245;
                                                                                                                                                                                                                                                                                                                                                                                               PROTEIN
                                                                                                                                                                                                                                                                 ţ
                                                                                                                                                                                                                                                                                                                                                                                                                   Glycoprotein;
                                                                                                       (IN
                                                                                                                     1).
                                                                                                                                                                                                                        KATLGGAI IKATTTK
                                                                                                                                                                                                                                                                 LLQVQGGVVKANTIN
                                                                    Length 2021;
                                                                                                        REF.
                                                       Indels
                                                                                          CRC64;
                                                       273;
                                                                                                                                                                                                                                                                                                                 TYPHUS)
                                                      Gaps
                                                                                                                                                                                                                        (IN
                                         67
                                                       37;
```

```
OMPB_RICCN
OMPB_RICCN
ID OMPB_R
AC Q9KKA3
DT 16-OCT
DT 16-OCT
DT 16-OCT
DT 01-MAR
DE (Surfa.
DE (Surfa.
DE (ANDB ON RICKET
OC 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   믕
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OMPB_RICCN STANDARD; PRT; 1655 AA.

O9KKA3; O9KC45;
16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
01-MAR-2002 (Rel. 41, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
Outer membrane protein B precursor (168 kDa surface-layer protein)
                                                                                                                                                            MEDLINE-21442074; PubMed=11557893;
Ogata H., Audic S., Renesto-Audiffren
Samson D., Roux V., Cossart P., Weisse
                                                                                                                                                                                                                                                         SEQUENCE FROM N.A. STRAIN=Malish 7;
                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; alpha subdivision; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB) (rOmp B) (Contains: 120 kDa surface-exposed protein (Surface protantigen) (120 kDa outer membrane protein ompB); 32 kDa beta pepti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1009
                               SEQUENCE OF 33-1649 FROM N.
                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                     OMPB OR RC1085
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1228
  STRAIN-Indian tick typhus, and
                                                                              "Mechanisms of evolution in Science 293:2093-2098(2001).
                                                                                                                                             Raoult
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QVTYTGTGSFTDTLTLNTTFDGAAKSGGNILIKSGSTLDLSGVSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FKDAVQLTQTGNIGGFLDFNAKNGTVTLNNNVNVAGTVK----NTGGTNNGTLIVLGASN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QAYLPGKSMM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NVAPGVKEGDVT----NVAQLKGVAQ----NLNNRI---DNVNGNARAGIAQAIATAGLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NFMNGGSVSGVVGTAAN-----SVGDITTAGATSFASSVNAKGTATLGGTTSFAHTFTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      T-RNGKNID--IATSMTPQFSSVSLG----AGADAPTLSVDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LNRVNGIAMLKVGAGNVTIAKGGNVKIGEIQGTGTNTLTLPAHFKLTGSINKTGGQALKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KENTLLIYNAVTITDDVNLEGIQNVLINNNADETSSTAFNAGTIQINDATYTIDANNGNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LLTAYHLTIGTVAEINIGAGNLFAIDASAGDVTILNAQDIHFRALDSALVLSNLTGVGVN 1068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ANNIDEGARSTLEENGPLDGGGNAIPYYEKGAI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGAVTLAKGSITSFAKNVTATSFVANSATINFGNSLAFNSNITGSG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KLTIAGGKTFGGAHKLQDIVFKGEGDFGTAGT--TFNTTNIVLDITGQLELGATTANVVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KTTTANGQT-GQADKFETV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NIPAGNIKFAHADAQLILQNSSGNDRTITLGANIDPDNDDEGIVILNSV-----TAG--K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYDTVEFLSADTKTTTVNVES-----KDNGKRTE-----VKIGAKTSVIKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NILLAADLVAPGVDEGTV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGS-TTGQSENVDFV--R
                                                                                                                                             o
                                                                                                                                                                                                                                                                                                                                                                                                                     conorii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KVISGNVSPSKG-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----KIKQSGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -AIGGGTYLGEAGYAIGYSSISD
                                                                                                                Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----VFDGG--VNGLNIGSNVAGAARNIGDVGGN
     Malish
                                                                                                                                                                       Weissenbach
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -NGDPTV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -TSGTKVTFASGN------GTTATV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENGSSTDEGEGLVTAKEVIDAVNKAGWRM 321
                                                                                                                                                                                               ₽.,
     7;
                                                                                                                conorii
                                                                                                                                                                  Fournier P.-E.
                                                                                                                                                                                                                                                                                                                                                                                              Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----ANGNNAILNVNTK
                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KMDETVNINAGNNIEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1554
                                                                                                                ₽.
                                                                                                                                                                                               P.-E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -HLNGIGST
                                                                                                                                                                       ب.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TTLTLGAN 1509
                                                                                                                                                                                               Barbe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            e protein
peptide]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  157
```

```
밁
                                                      Q
                                                                                밁
                                                                                                  Qy
                                                                                                                             망
                                                                                                                                                  Qy
                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                            Matches
                                                                                                                                                                                       Query Match
Best Local :
                                                                                                                                                                                                                                                                      VARIANT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                 CONFLICT
                                                                                                                                                                                                                                                                                                                                             VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                              VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ROUX V., Raoult D.;

ROUX V., Raoult D.;

"Phylogenetic analysis of members of the genus Rickettsia gene coding the outer-membrane protein rOmpB (ompB).";

gene coding the Nicrobiol. 50:1449-1455(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     australis, the most divergent rickettsia of the spotted fever Submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: THE 120 KDA SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               modified and this statement
                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                      VARIANT
                                                                                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                       CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                              Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                          Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; .AF149110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "The rickettsial outer membrane protein A and B australis, the most divergent rickettsia of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Stenos J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=20393643; PubMed=10939649
                                                                                                                                                                                                                                                                                                                                                                                                                                                      InterPro;
                                                                                                                                                                                                                                                                                                                                   VARIANT
            113
                                   215
                                                                                155
                                                                                                       46
                                                                                                                              95
                                                                                                                                                   10 NSALNAWVVVSELT-----RNH-----TKRASATVATAVLATILSA
                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     s SWISS-PROT entry is copyright. It is produced through a ween the Swiss Institute of Bioinformatics and the EMBL European Bioinformatics Institute. There are no restrict
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SUBCELLULAR LOCATION: CELL WALL. THIS BACTERI LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VIRULENCE FACTOR AND/OR IMMUNOGEN DURING
                                                                                                      TVQANATDTDEDEELESVAR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (BY SIMILARITY)
---LKIKQSGKDF--TYSLKKELKDLTSVETE-----KLSFGANGNKVNITSDTKGLNF
                                 {\tt NVTNGFIKVSSKSFATVNVINIGD-GQGIMFNTDADNVNTLNLQANGATITFNGTDGTGR}
                                                                                VAQVNNGAAIDNNDLQGVGRIDCGAAASTLVFNLANPTTQKAPLILGDNAVIVNGANGTL
                                                                                                                              NTANNLDVTVREDTTLGFITNVVNNANHFNLMLNAGKTLTITGQGITNVQAAATKNANNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AF123721;
AF123726;
                                                                                                                                                                                                                                                                                                                                                                                                                                        PF02708; rOmpA_rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AE008659;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                            S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   23721; AAF34124.1; -. 23726; AAF34129.1; -. 49110; AAD39533.1; -. IPR003858; rOmpA_rOmpB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Walker D.;
                                                                                                                                                                                                                                                            78
251
413
959
988
1139
353
376
1159
1177
                                                                                                                                                                                                                                                                                                                                                                                                       1335
                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAL03623.1;
                                                                                                                                                                                                                                                 1492
                                                                                                                                                                                                                                                            988
1139
354
776
1159
1177
                                                                                                                                                                                                                                                                                                                                  1655
61
75
78
251
413
959
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   institute. There are no rest institutions as long as its content atement is not removed. Usage by ilicense agreement is
                                                                                                                                                                                      6.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FROM
                                                                                                                                                                                                                                       168342
                                                                                                                                                                                                                                                                                                                                                                                                                              wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N.A.
                                                                                                                                                                                                                                A -> T (IN STRAIN INDIAN T

R -> L (IN STRAIN INDIAN T

KD -> GH (IN REF. 3).

F -> S (IN REF. 3).

E -> D (IN REF. 3).

G -> S (IN REF. 3).

G -> R (IN REF. 3).

MW; E49E19377D5FCE37 CRC6'
                                                                                                                                                                                                                                                                                                                   P -> A (IN STRAIN INDIAN T
G -> S (IN STRAIN INDIAN T
K -> N (IN STRAIN INDIAN T
V -> A (IN STRAIN INDIAN T
N -> D (IN STRAIN INDIAN T
I -> V (IN STRAIN INDIAN T
A -> T (IN STRAIN INDIAN T
                                                                                                                                                                                                                                                                                                                                                                                                                       1.
; Complete proteome.
                                                                                                                                                                                      Score 186;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                      120 KDA SURFACE-EXPC
32 KDA BETA PEPTIDE.
                                                                                                       SALVLQF--
                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                   KDA SURFACE-EXPOSED
                                                                                                                                                                   J.048;
293;
                                                         DDHNTL----HGATVTLKAGDN---
                                                                                                                                                                                                  DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       genes of spotted f
                                                                                                                                                                                                 Length 1655;
                                                                                                                                                                                                                                       CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       no restrictions
                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SI
                                                                                                                                                                                                                                                                                                            TICK
TICK
TICK
TICK
TICK
TICK
TICK
TICK
                                                                                                                                                                                                                                                                                                                                                                                                                   PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COVERED
                                                                                                       MIDKEGNGEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Rickettsia
                                                                                                                                                                             208;
                                                                                                                                                                                                                                                                                                                                            K TYPHUS).
K TYPHUS).
K TYPHUS).
K TYPHUS).
K TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      using
                                                                                                                                                                                                                                                                                                           ( TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             מ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       group.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ву
                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ×
                                                                                                       82
                                                                                                                              154
                                                                                                                                                      45
            161
                                   273
                                                                                214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ş
                                                                                                                                                                             39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       its
```

VNGQLKANAG DTLAGSSAS! : : : : : : : : : : : : : : : : : : :
162 AKETAGTNGDPTVHLNGIGSTLTDTLAGSASH-VDAGNQAVIGTNNG 327 162 AKETAGTNGDPTVHLNGIGSTLTDTLAGSSASH-VDAGNQSTHYTRAASI 210

Search completed: July 3, 2002, 08:29:54 Job time: 1165 sec

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                  Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Total number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       on:
   10
10
11
12
13
14
14
                                                                                                                                                                                                    Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
  2862
2713.5
2694.5
2686.5
2686.5
2625.5
2610.5
2610.5
2573.5
2571.5
2571.5
2571.5
                                                                                                                                                         Score
                                                                                                                             2994
2979
                                                                                                                                                                                                                                                                                                                                                                                                                                                      seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                      SPTREMBL_19:*
1: sp_archea:*
2: sp_bacteria:
3: sp_fungi:*
                                                                                                                                                       %
Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                       length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                hits satisfying chosen parameters:
 100.0
99.5
99.5
99.4
91.4
90.0
89.7
87.7
87.7
87.2
87.2
87.3
85.8
85.8
                                                                                                                                                                                                                                          8:
9:
110:
112:
12:
13:
15:
17:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-771-382-3
2994
1 MNKIYRIIWNSALI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    562222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       July
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Copyright (c) 1993 - 2000 Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNKIYRIIWNSALNAWVVVS.....TASGNSRGHFGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                               sp_archea:*
sp_bacteria:*
                                                                                                                                                                                                                                                                                                                  sp_phage: *
                                                                                                                                                                                                                                                                                                                                   sp_mammal:*
sp_mhc:*
                                                                                                                                                                                                                                                                                                                         sp_organelle: *
                                                                                                                                                                                                                                                                                                                                                      sp_invertebrate:*
                                                                                                                                                                                                                                                                                                                                                              sp_numan:*
                                                                                                                                                                                                                                                  sp_rvirus:*
sp_bacteriap:*
                                                                                                                                                                                                                                                                    sp_vertebrate:*
sp_unclassified:*
                                                                                                                                                                                                                                                                                     sp_virus:*
                                                                                                                                                                                                                                         sp_archeap:*
                                                                                                                                                                                                                                                                                               sp_rodent:*
                                                                                                                                                                                                                                                                                                       sp_plant:*
                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                       2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   seqs, 172994929 residues
  2002, 08:28:39; Search time 168.02 Seconds (without alignments) 606.440 Million cell updates/sec
                                                                                                                                                          DΒ
   \mathfrak{a}
 Q9JQW4
Q9JPT0
Q9JPS0
Q9JPS0
Q9JPH7
Q9JPR9
Q9JPR3
Q9JPS3
Q9JPS3
                                                                                 Q93QY1
Q9JPIO
Q9JPS8
Q9JPS5
Q9JPR8
Q9JPR8
Q9JPR7
                                                                                                                                                         Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                    summaries
                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  562222
093qyl neisseria m
093ph0 neisseria m
093ph0 neisseria m
093ps8 neisseria m
093ps8 neisseria m
093pr7 neisseria m
093pr7 neisseria m
093pt0 neisseria m
093pt0 neisseria m
093py5 neisseria m
093py6 neisseria m
093py6 neisseria m
093py7 neisseria m
093py7 neisseria m
093py8 neisseria m
                                                                                                                                                        Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 589
                                                                        .....
```

Ü	4	ω	2	=	Ö	39	38	37	36	35	34	ü	2	2				27								9	8	17
218	218.5	220.5	221	225.5	232.5	235	235.5	239.5	246	257.5	262	330.5	352	399	423	444.5	1169.5	1179.5	2341.5	2343.5	2462.5	2467	2475.5	2479	2479	2490.5	2512.5	
7.3					7.8								11.8		14.1			39.4										
4919	2747	3930	945	873	1018	1417	989	1265	1953	1004	1291	2712	1107	1190	2059	1299	1098	2353	530	526	592	591	592	591	591	592	600	594
N	N	16	N	N	16	16	N	2	16	16	16	16	N	16	16	16	2	N	ν	2	N	N	N	16	N	N	N	2
Q9ZHL0	Q9L800	Q98E20	Q93F03	Q9L960	90MH6	Q9HVN6	Q9XD84	Q9FDA0	Q98HJ2	Q9PD63	Q92KQ7	Q9F3X5	Q9F2D8	Q9PC04	Q9PD50	Q9F3X6	Q48152	P71401	Q9JPS1	Q9JPS4	Q9AQF0	Q93QY3	Q9JPS9	Q9JR18	Q9JPS7	Q93QY2	Q9JPS6	Q93QY4
Q9zh10 haemophilus	Q91800 aeromonas s	0	Q93f03 shigella fl	Ħ	6		Q9xd84 escherichia	Q9fda0 xanthomonas	N		Q92kq7 rhizobium m	Q9f3x5 pasteurella	(C)	xylella		Q9f3x6 pasteurella		P71401 haemophilus		Q9jps4 neisseria m	Q9aqf0 neisseria m	Q93qy3 neisseria m	Q9jps9 neisseria m	Q9jr18 neisseria m	Q9jps7 neisseria m	Q93qy2 neisseria m	Q9jps6 neisseria m	Q93qy4 neisseria m

## ALIGNMENTS

```
RESULT
Q93QY1
                 Q
                                         밁
                                                                                                                                                                               QΥ
                                                                               밁
                                                                                                   Q
                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                             Q93QY1 PRELIMINARY;
Q93QY1;
01-DEC-2001 (TrEMBLrel. 1
01-DEC-2001 (TrEMBLrel. 1
01-DEC-2001 (TrEMBLrel. 1
                                                                                                                                                                                       STRAIN-P20;
STRAIN-P20;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel of membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157610; AAK68871.1;
                                                                                                                                                                                                                                                                          Neisseria meningitidis.
Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                            NHHA.
                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                      NHHA OUTER
121
                   121
                                         61
                                                              61
                                                                               DFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIG 180
                                      DFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVHLNGIG
                                                                                                                          589;
                                                                                                                                                                                                                                                                                                                      MEMBRANE PROTEIN
                                                                                                                                                                               589 AA;
                                                                                                                           Conservative
                                                                                                                                                                               61448 MW;
                                                                                                                                     100.0%;
                                                                                                                                                                                                                                                                                                                                19,
19,
                                                                                                                                                                                                                                                                                       beta
                                                                                                                                                                                                                                                                                                                               Created)
Last sequence update)
Last annotation update)
                                                                                                                           0;
                                                                                                                                     Score 2994; DB 2;
Pred. No. 3.6e-118;
                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                               1F1A80CD610CB230 CRC64;
                                                                                                                                                                                                                                                                                       subdivision; Neisseriaceae; Neisseria.
                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                            589
                                                                                                                           0;
                                                                                                                                                Length
                                                                                                                           Indels
                                                                                                                           0;
                                                                                                                           Gaps
                                                                                                                                                                                                                         outer
                                                                                   60
 180
                                                                                                       60
                                                                                                                           0;
```

```
QY
                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
  DЪ
                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                               ACCOMPAGNATION OF THE PROPERTY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                   STRAIN-NGP165, 90/18311, AND 93/4286;

XX MEDLINE-20175756; PubMed=10710308;

XA Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

XA Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

XA Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.

XA Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti :

XA Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

XA Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

YA Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

YA Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

"Meningococcus by Whole-Genome Sequencing.";

EMBL; AF226363; AAF42511.1;

REMBL; AF226363; AAF42511.1;

SEQUENCE 589 AA; 61520 MW; 2B2A95D4868566A6 CRC64;
                                                                                                                                                                                           Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9JPIO;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A. STRAIN=NGP165, 90/MEDLINE=20175756;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9JPI0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                           y Match
Local Si
hes 586;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
    61
                                                 61
                                                                                                Н
                                                                                                                                               \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N
                                                                                                                        MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRT
IGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN
                                                                                                MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NVAPGYKEGDYTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DQGNITYKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMA
                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0 (TrEMBLrel. 15, 0
0 (TrEMBLrel. 15, 1
1 (TrEMBLrel. 16, 1
                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PROTEIN GNA992.
                                                                                                                                                                                                                 99
                                                                                                                                                                                                                 . 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    beta
                                                                                                                                                                                      Pred. No. 1.5e
1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sequence
                                                                                                                                                                                                            DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                                                                                                                        Length
                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Tettelin H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ni B.,
Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria
                                                                                                                                                                                         0:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C
                                                                                                                                                                                         Gaps
                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                         0;
```

δδ 밁 QY

19 ш

ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ---

Query Match
Best Local Similarity
Matches 565; Conser

Conservative

6,

Gaps

۳

```
RP SEQUENCE FROM N.A.

RP SEQUENCE FROM N.A.

RC STRAIN=528, AND 1000;

RX MEDLINE=20175756; PubMed=10710308;

RA Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

RA Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

RA Comanducci M., Jennings G.T., Baldi L., Bartolini E., Mora M., Nuti S.,

RA Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

RA Ratti G., Santhni L., Savino S., Scarselli M., Storni E., 2uo P.,

RA Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

RA Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

RA MOXON E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).

EMBL; AF226356; AAF42509.1;

DR EMBL; AF226356; AAF42509.1;

DR EMBL; AF226356, AAF42509.1;

DR EMBL; AF226356, AAF42509.1;

DR EMBL; AF226356, AAF42509.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                               Q9JPH0;
Q9JPH0;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                      OUTER MEMBRANE GNA992.
                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NVAPGVKEGDYTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPGKSMMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLAQAYLPGKSMMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     {\tt GEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKD}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSENVDFVRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STLTDTLAGSSASHYDAGNQSTHYTRAASIKDYLNAGWNIKGVKTGSTTGQSENVDFVRT
                                                                                                                                                                                                                                                                                                                            Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                (TrEMBLrel. 15, Last (TrEMBLrel. 16, Last
                                                                                                                                                                                                                                                                                                                                                                                                             (TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
              95.6%;
                                                                                                                                                                                                                                                                                                                                                                     GNA992.
                                                                                                                                                                                                                                                                                                                            beta
; Score 2862; D
; Pred. No. 1.2e
7; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                             Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                            subdivision;
                                                                                                                                                                                                                                                                                                                                                                                  sequence up
annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                           595
  DB 2;
l.2e-112;
les 17;
                                                                                                                                                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                                                                                                                                                                                                                                             update)
                                                                                                                                                                                                                                                                                                                            Neisseriaceae;
                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              589
                                                                                                                                                                                                                                                                                                                             Neisseria.
                                                                                                                                                                                                              :
:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
```

Ş DЬ

118 61

EPVVRSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQNTD

174

```
919584 110 091958 110 091958 110 091958 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09195 110 09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                      γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
    В
                                                                                          Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                           Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Commanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Baroeker M., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9JPS8;
01-OCT-2000
                                                                                                                                                                                                          Meningococcus by Whole-Genome Sequencing. Science 287:1816-1820(2000).
EMBL; AF26364; AAF42513.1; -.
SEQUENCE 599 AA; 62693 MW; 46C2E974AF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-A22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9JPS8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                  Local
                                             ш
                                                                                                                                          Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGEN
ETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDAN 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTKYTFASGNGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATVSKDDQGNITYKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSEN
                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (TrEMBLrel. 15, (TrEMBLrel. 16,
                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                  91.4%;
90.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                          Score 2738; DB 2;
Pred. No. 1.9e-107;
4; Mismatches 33;
                                                                                                                                                                                                            46C2E974AF7F78E9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          599
                                                                                                                                                                                                                                                                               Against
ing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             update)
                                                                                                                                                                                                            CRC64
                                                                                                                                Length
                                                                                            Indels
                                                                                          10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          595
                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                             · s.,
    60
                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                        1;
```

δõ

ш

MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL

Query Match Best Local S Matches 540

al Similarity 540; Conser

Conservative

15;

Score 2713.5; Pred. No. 2e-1 15; Mismatches

3.5; DB 2e-106;

600; 11;

34; 2

Indels Length

Gaps

2;

60

90.6%;

```
RESULT
Q9JPS5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          οy
   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
AREDLINE-20175756; PubMed=10710308;

WARDLINE-20175756; PubMed=10710308;

APIZZA M., SCARLATO V., MASIGNANI V., GIULIANI M.M., ARICO' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Caleotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Ra Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Ra Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Ra Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Ra Broeker M., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Ra Moxon E.R., Grandi G., Rappuoli R.,

"Identification of Vaccine Candidates Against Serogroup B

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).

EMBL; AF226372; AAF42521.1;

EMBL; AF226372; AAF42521.1;
                                                                                                                                                                                                                                                                                                              Q9JPS5 PRELIMINARY; PRT; 600 AA. 09JPS5; 01-OCT-2000 (TrEMBLrel. 15, Created) 01-OCT-2000 (TrEMBLrel. 15, Last sequence update) 01-MAR-2001 (TrEMBLrel. 16, Last annotation update) 01TER MEMBRANE PROTEIN GNA992.
                                                                                                                                                                                                        STRAIN-E32
                                                                                                                                                                                                                        SEQUENCE FROM
                                                                                                                                                                                                                                                    NCBI_TaxID=487;
                                                                                                                                                                                                                                                                    Neisseria meningitidis
Bacteria; Proteobacter
                                                                                                                                                                                                                                                                                                    GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                            u
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS 470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DTTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENTDENTNASSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EPVKRTAVVLSFRSDKEGTGEKEVTEDSHWGVYFDEKGVLKAGTITLKAGDNLKIKQNTD
                                                                                                                                                                                                                                                                    Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                        N.A.
                                                                                                                                                                                                                                                                    beta
                                                                                                                                                                                                                                                                    subdivision;
                                                                                                                                                                                                                                                                    Neisseriaceae;
                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                           s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        맒
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вb
-
       membrane p
Submitted
                                                                                                                         MEDLINE-20175756; PubMed=10710308;
Plzza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.
Plzza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecch
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., N
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningcoccus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
       Peak I.R., Srikhanta Y., Dieckelman M., Moxon F
"Identification and characterization of a gene
membrane protein of Neisseria meningitidis.",
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ d
                                                                                                                                                                                                                                                                                                      STRAIN-NGH38;
MEDLINE-20175756;
                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Prote
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                        GNA992 OR NHHA.
Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPR8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDPTVHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SKDANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNRIDNYNGNARAGIAQAIATAGLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NENTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EPVVRTAPVLSFHSDKEGTGEKEEVGASSNLTVYFDKNRVLKAGTITLKAGDNLKIKQNT
                                                                                                                                                                                                                                                                                                                                        FROM
                                                                                                                                                                                                                                                                                                                                                                                           Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                           (TrEMBLrel. 15, Creat
(TrEMBLrel. 15, Last
(TrEMBLrel. 19, Last
ANE PROTEIN GNA992 (NH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTN
                                                                                            N.A.
                                                                                                                                                                                                                                                                                                                                        N.A.
                                                                                                                                                                                                                                                                                                                                                                                           beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                           (NHHA
                                                                                                                                                                                                                                                                                                                                                                                           subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -DIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                          sequence update)
annotation update)
HHA OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A
                                                                                                                                                                                                                                                                                                                                                                                          Neisseriaceae;
                                       R., Jennings
e encoding a r
          databases
                                                                                                                                                                                                                                                                  Capecchi
                                                                                                                                                                                                Venter
                                                                                                                                                                                                                                Dapecchi B.
M., Nuti
E., Zuo P.,
                                          novel
                                                                                                                                                                                                                                                                                                                                                                                           Neisseria
                                                                                                                                                                                                C
                                                                                                                                                                                                                                                    s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
     RESULT
SOJERT
ID QS
AC QS
DT DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
DT QS
D
                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                        QY
                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DR
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Ma
Best Loc
Matches
                                                                                                                                                                              Q9JPR7 PREI
Q9JPR7;
Q9JPR7;
Q1-CCT-2000 (TrE
Q1-OCT-2001 (TrE
Q1-MAR-2001 (TrE
QUTER: MEMBRANE E
GNA992.
 SEQUENCE FROM N.A.
STRAIN-SWZ107;
MEDLINE-20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V.,
Comanducci M., Jennings G.T., Baldi |
Galeotti C.L., Luzzi E., Manetti R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; AF2
EMBL; AF1
SEQUENCE
                                                                                                                                            Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                            NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                           599
                                                                                                                                                                                                                                                                                                                                                                                                                                             539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 y Match
Local Similarity
hes 539; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \vdash
                                                                                                                                                                                                                                                                                                                                                                           Σ,
                                                                                                                                                                                                                                                                                                                                                                                                          Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; AF226383;
; AF157608;
ENCE 599 A
                                                                                                                                                                                                                                                                                                                                                                           599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; AAF42532.1;
; AAK68869.1;
AA; 62844 MW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      90
06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WW.
                                                                                                                                                beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14;
```

```
AQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                      VQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                           DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                        (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last seq
(TrEMBLrel. 16, Last ann
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SGKDFTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2694; up
Pred. No. 1.3e
14; Mismatches
                                                                                                                                                      PRT;
                                                                               subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BBA16EBF53C1970C
                                                                                                                   sequence up
annotation
i L., Barcor,
Marchetti
                        Giuliani
      Bartolini
rchetti E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .3e-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BG
                                                                               Neisseriaceae;
                        м. м.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CRC64;
                E.,
    E., Capecchi
Mora M., Nii+
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                       Arico'
                         ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14;
                                                                               Neisseria
       Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
       s ·
                                                                                                                                                                                                                                                                                                                               468
                                                                                                                                                                                                                                                                                                                                                 418
                                                                                                                                                                                                                                                                                                                                                                   408
                                                                                                                                                                                                                                                                                                                                                                                    358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                             478
                                                                                                                                                                                                                                                                                                                                                                                                      348
                                                                                                                                                                                                                                                                                                                                                                                                                        298
                                                                                                                                                                                                                                                                                                                                                                                                                                          288
                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ω
```

```
RESULT OPPORTUDING OF STATE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SO RET RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Ma
Best Loca
Matches
                                                                                                                                                 O9JOW4 PRELIMINARY;
OJYCW4:
O1-OCT-2000 (TrEMBLrel. 1
O1-OCT-2001 (TrEMBLrel. 1
O1-DEC-3001 (TrEMBLrel. 1
PUTATIVE SURFACE FIBRIL P
NMA1200 OR GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
                                                                                           Neisseria meningitidis (s
Neisseria meningitidis.
Bacteria; Proteobacteria;
   STRAIN=22491 / SEROGROUP A / SEROJ
MEDLINE=20222556; PubMed=10761919;
                     SEQUENCE FROM N
STRAIN-Z2491 / :
                                                                         NCBI_TaxID=65699,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                               531
                                                                                                                                                                                                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Match
                                                                                                                                                                                                                                                                                                     α
                                                                                                                                                                                                                                                                                                                                                        KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                  KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EPVQRTAPVLSFHADSEGTGEKEVIGNTNLGIYFDEKRVLKAGTITLKAGDNLKIKQNTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11 Similarity
537; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    598 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                           487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             42534.1; -.
62431 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   89.7%;
                                                                                                                                                                     . 15, Created)
. 15, Last sequence upo
. 19, Last annotation of the protein (OUTER MEMBRA)
                                                                                                                                (serogroup
                                                                                             beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
Pred.
                     SEROTYPE
                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                core 2686.5;
red. No. 2.7e
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0881CC094F33B4D4
                                                                                           subdivision;
                                                                                                                              A),
                                                                                                                                                                                                                                                                592
                                                                                                                                and
                                                                                                                                                                     MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5; DB 2;
2.7e-105;
les 39;
                                                                                                                                                                                                                                                                ₹
                                                                                                                                                                                                          update)
                                                                                                                                                                                          update)
                                                                                             Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRC64;
                                                                                                                                                                     PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                     GNA992).
                                                                                             Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ,
G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                          598
                                                                                                                                                                                                                                                                                                                                                                                               589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       410
                                                                                                                                                                                                                                                                                                                                                                                                                                  539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
```

```
Qy
δÃ
                          밁
                                                 δÃ
                                                                             밁
                                                                                                   Qy
                                                                                                                                 B
                                                                                                                                                          Š
                                                                                                                                                                                     Ъ
                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SQ X KW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
A Moxon E.R., Grandi G., Rappuoli R.;
Tidentification of vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.*;
Science 287:1816-1820(2000).
EMBL; AF126357; AAF42506.1; -.
R EMBL; AF26357; AAF42514.1; -.
R EMBL; AF26336; AAF42514.1; -.
R EMBL; AF26336; AAF4251.1; -.
R EMBL; AF26336; AAF42535.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AF226357; AAF
EMBL; AF226365; AAF
EMBL; AF226373; AAF
EMBL; AF226386; AAF
Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Parkhill J., Achtman M., James K.D., Bentley S.D., Churche Klee S.R., Morelli G., Basham D., Brown D., Chillingworth Davies R.M., Davis P., Deviln K., Feltwell T., Hamlin N., Jagels K., Leather S., Moule S., Mungall K., Quail M.A., Rathadream M.A., Rutherford K.M., Simmonds M., Skelton J., Whitehead S., Spratt B.G., Barrell B.G.; Strain of Neisseri "Complete DNA sequence of a serogroup A strain of Neisseri meningitidis Z4491.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Nature [2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=205900, BZ133, F6124, AND Z
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                           477
                                                    474
  534
                                                                                                        414
                                                                                                                                  357
                                                                                                                                                            354
                                                                                                                                                                                       297
                                                                                                                                                                                                              294
                                                                                                                                                                                                                                          237
                                                                                                                                                                                                                                                                   234
                                                                                                                                                                                                                                                                                             177
                                                                                                                                                                                                                                                                                                                      174
                                                                                                                                                                                                                                                                                                                                                 117
                                                                                                                                                                                                                                                                                                                                                                           118
                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                       PGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQW
                                         NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYL
                                                                                           DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
                                                                                                                                 NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT
                                                                                                                                                                                                                                         VHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSE
                                                                                                                                                                                                                                                                                                                                                                                                     ESVQRS-VVGSIQASMEGSGELET---ISLSMINDSKEFVDPYIVVTLKAGDNLKIKQNI
                                                                                                                                                                                                                                                                                                                                                                                                                  ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHG-ATVTLKAGDNLKIKQ--
                          NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                               DETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSKDA
                                                                                                                                                                                                                                                                                             VHLNGIGSTLTDTLAGSSASHVDAGNQSTHYTRAASIKDVLNAGWNIKGVKTGSTTGQSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               404:502-506(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             À,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         87.7%;
89.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 2626.5; DB 1
Pred. No. 8.7e-103;
3; Mismatches 41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AD22E2F5EEF8F754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Z2491;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             , Arico' B.,
E., Capecchi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Churcher
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tettelin H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Holroyd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ς,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    s;
                                                    533
                                                                                476
                                                                                                                                  416
                                                                                                                                                            413
                                                                                                                                                                                                                                                                                                                                                  176
                                                                                                                                                                                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                                                                                                                     116
                                                                                                                                                                                                                                                                                                                                                                                                                              117
                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                       356
                                                                                                                                                                                                              353
                                                                                                                                                                                                                                          296
                                                                                                                                                                                                                                                                   293
                                                                                                                                                                                                                                                                                             236
                                                                                                                                                                                                                                                                                                                      233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4.
```

```
PROPERTY OF STREET OF STRE
                                                                                                                      δÃ
                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                В
          밁
                                            Qy
                                                                                В
                                                                                                                                                              В
                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Ma
Best Loc
Matches
£
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Meningococcus by Whole-Genome Sequencing.";
Science 28:1816-1820(2000).
EMBL; AF226359; AAF42508.1; -.
SEQUENCE 598 AA; 62763 MW; 63A6A3BD7F0F2EE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-2000 (TremBLrel. 15, Cr
01-OCT-2000 (TremBLrel. 15, La
01-MAR-2001 (TremBLrel. 16, La
0UTER MEMBRANE PROTEIN GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria;
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q9JPTO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9JPT0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GNA992.
                                                                                                                                                                                                    349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
          478
                                                  469
                                                                                      418
                                                                                                                                                                                                                                              298
                                                                                                                                                                                                                                                                                  289
                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                            229
                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                        171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                  358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                          KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                                                                                                                                                    A--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                          TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                                MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
          GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                              GSKDANKPYRITNVAPGYKEGDYTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                  SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                      SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                  SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                    DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EPVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity 87.9
28; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 87.78;
87.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
Last seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2625.5; DB 2
Pred. No. 9.6e-103;
B; Mismatches 40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             63A6A3BD7F0F2EE3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sequence up
annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 s.
                                                                                                                                                                                                                                                                                348
                                                                                                                                                                                                                                                                                                                                                      288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                    477
                                                                                                                                                                                                                                          357
                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ър
                                                                                                                                        Qy
                                                                                                                                                                                  망
                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                            д
                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                            478
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                    Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q93QY5;
Q93QY5;
01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        reak I.R., Srikhanta Y., Dieckelman M., Moxon R., "Identification and characterization of a gene ent membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ data EMBL; AF157603; AAK68864.1; -. SEQUENCE 598 AA; 62687 MW; 18CEFFE6410A15DF CF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NHHA
                      469
                                                                    409
                                                                                           358
                                                                                                                349
                                                                                                                                        298
                                                                                                                                                               289
                                                                                                                                                                                     240
                                                                                                                                                                                                           229
                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                         171
                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 529
                                                                                                                                                                                                                                                                                                                                                                                                                                y Match
Local :
                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            10
KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                              TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                              DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                       D-----
                                                                                                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ε
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                        ESVARSALVLQFMIDKEGNGEIESTGDIGWSIXYDDHNTLHGATVTLKAGDNLKIKQSGK
                                                                                                                                                                                                                                                                                                                                                                        MNKISRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                ENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                            EPVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTN 119
                                                                                                                                                                                                                                  DPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     589
                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01 (TrEMBLrel. 19, C
01 (TrEMBLrel. 19, I
01 (TrEMBLrel. 19, I
02 MEMBRANE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N.A.
                                                                                                                                                                                                                                                                                           -FTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                 87.4%;
87.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            beta
                                                                                                                                                                                                                                                                                                                                                                                                                      18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Last
Last
                                                                                                                                                                                                                                                                                                                                                                                                                  Score 2616.5;
Pred. No. 2.3e
18; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sequence up
annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                 2616.5
No. 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       598
                                                                                                                                                                                                                                                                                                                                                                                                                          .0.5;
2.3e-∋
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                                                                                                                                                                                                                             DB
-102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     databases
                                                                                                                                                                                                                                                                                                                                                                                                                                            2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Jennings
coding a r
                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           novel
                                                                                                                                                                                                                                                                                                                                                                                                                      15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .
P
                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           outer
                                                                    468
                                                                                                                 408
                                                                                                                                                                                                                                                         228
                                                                                                                                                                                                                                                                                                                                                                          59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           597
                                              477
                                                                                                                                        357
                                                                                                                                                                                                          288
                                                                                                                                                                                                                                                                                179
                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                     297
                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                       4
```

```
В
                                                                                                                                                                            Ş
                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
              Ş
                                         밁
                                                                    Ş
                                                                                               망
                                                                                                                     Qy
                                                                                                                                                                                                                                                                                         20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
HOOD D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.,
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                       EMBL; AF1
EMBL; AF1
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                  Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennir "Identification and characterization of a gene encoding membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases EMBL; AF226381; AAF42530.1; -. EMBL, AF157607; AAK68868.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
00TER MEMBRANE PROTEIN GNA992 (NHHA OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-DEC-2001 (TrEMBLrel. 19,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID-487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GNA992 OR NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q9JPS0;
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPS0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              589
                 289
                                          240
                                                                                                 180
                                                                                                                          171
                                                                                                                                                     120
                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    529
                                                                                                                                                                                                            60
                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                               _
                                                                                                                                                                                                                                                                                          ш
KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                          A--
                                                                                                               DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                    ENTNENTNDSSETYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG.
                                                                                                                                                                                                                        ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                                                                                                                                                                                                            MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ε
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ε
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQ
                                                       TGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                              DPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                         EPVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTN
                                                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               589
                                         SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                          Α,
                                                                                                                                                                    -FTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                  87.2%;
87.4%;
                                                                                                                                                                                                                                                                                                                                                                                          ž
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     beta
                                                                                                                                                                                                                                                                                                                       19;
                                                                                                                                                                                                                                                                                                                                 Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     subdivision;
                                                                                                                                                                                                                                                                                                                                                                                        E6C7AEF0BB8A63CB
                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                  2610.
No. 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                598
                                                                                                                                                                                                                                                                                                                    4.1e-102;
ches 42;
                                                                                                                                                                                                                                                                                                                                                .
5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₿
                                                                                                                                                                                                                                                                                                                                               DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                        CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Jennings
                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ω,
                                                                                                                                                                                                                                                                                                                                                                                                                                                          novel
                                                                                                                                                                                                                                                                                                                     15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P.,
                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                           outer
                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         597
                                                                                                                       228
                                                                                                                                                     179
                                                                                                                                                                              170
                                                                                                                                                                                                                                                               59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   588
                                         297
                                                                    288
                                                                                               239
                                                                                                                                                                                                                                                                                                                     4;
```

```
RESULT POPULATION OF THE POPUL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
B
                                   Qy
                                                                                        Вþ
                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C STRAIN=B2198, AND 297-0;

X MEDLINE=20175756; PubMed=10710308;

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B. Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B. A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecci A. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., I Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuc Ratti G., Santini L., Kasyn B., Blair E., Mason T., Tettelin A Brocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin A Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000).
                                                                                                                                                                                 Matches
                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-OCT-2000 (TrEMBLrel. 1.
01-OCT-2000 (TrEMBLrel. 1:
01-DEC-2001 (TrEMBLrel. 1:
0UTER MEMBRANE PROTEIN GNA
GNA992 OR NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q9JPH7;
01-OCT-2000
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria
Bacteria;
                                                                                                                                                                                                                                                                                               "Identification and characterization of a gene encoding membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases. EMBL; AF226368; AAF42517.1; -. EMBL; AF226358; AAF42507.1; -. EMBL; AF127604; AAF42567.1; -. EMBL; AF157604; AAF468865.1; -. SEQUENCE 594 AA; 62361 MW; 436BDDED68263C5C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9JРН7
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Peak I.R., Srikhanta Y., Dieckelman M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              298
60
                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12
                                                                                        1
                                                                                                                                   1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EPVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTN
                     ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK 120
                                                                                        MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLFATVQANATD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        589
                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitidis.
Proteobacteria;
                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                         98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       . 15, Last sequence update)
. 19, Last annotation update)
GNA992 (NHHA OUTER MEMBRANE
                                                                                                                                                                                                       . 68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15,
15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         beta
                                                                                                                                                                                 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Created)
                                                                                                                                                                                                       Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         subdivision;
                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                       2573.5;
No. 1.4e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Moxon R.,
                                                                                                                                                                                                         .4e-100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ą
                                                                                                                                                                                                                               DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseriaceae;
                                                                                                                                                                                   49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Jennings
                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PROTEIN)
                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Arico'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Tettelin H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Capecchi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                        മ
                                                                                                                                                                                 11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                M.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nuti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   417
                                                                                        59
                                                                                                                                      60
                                                                                                                                                                                 4;
```

```
RESULT
Q9JPR9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
       Ş
                                 밁
                                                      δÃ
                                                                                                                                             γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                               Query Ma
Best Loc
Matches
der.
                                                                                                                                                                     STRAIN=NGH36;
MEDLINE=201756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffiles A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                      Meningococcus by Whole-Genome Sequencing Science 287:1816-1820(2000).
EMBL; AF226382; AAF42531.1; -.
                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
01-MAR-2001 (TrEMBLrel.
OUTER MEMBRANE PROTEIN G
                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                          Bacteria;
                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                   GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JPR9
                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9JPR9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               293
                                                                                 Local Similarity
nes 517; Conser
         61
                                                                                                        Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKG
:||||||||||||||||||||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ENGSSTDEGEGIVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--S
      ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                     FROM N.A.
                                                                                                                                                                                                                                                                                                                                                        Proteobacteria;
                                                                               85.9%;
.larity 86.0%;
Conservative 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                           42531.1; -.
62718 MW;
                                                                                                                                                                                                                                                                                                                                                                                            . 16, Last
GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                         15,
16,
                                                                                                                                                                                                                                                                                                                                                         beta
                                                                                 20;
                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                               Score 2571.5; DB 2;
Pred. No. 1.8e-100;
D; Mismatches 49;
                                                                                                                                            9095F8E31AD7C76D
                                                                                                                                                                                                                                                                                                                                                       subdivision; Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                        sequence update) annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                          598
                                                                                                                                                                                                                                                                                                                                                                                                                                                          A
                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                            CRC64
                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                        Neisseria
                                                                                 15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      594
                                                                              Gaps
                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              412
                                 59
                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                 4
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                      pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecc Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zu Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Vente Moxon E.R., Grandl G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JPS3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-OCT-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
01-MAR-2001 (TrEMBLrel.
OUTER MEMBRANE PROTEIN G
  Meningococcus by Whole-Genome Science 287:1816-1820(2000). SEMBL; AF226378; AAF42527.1; -- SEQUENCE 590 AA; 61661 MW;
                                                                                                                                                                                                                                                                       MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                      STRAIN-NGE28;
                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                               Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ε
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KGKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DPTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISDTGNWVIKGTASGNSRGHFGTSASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    D-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSKDTNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNALAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SKGKMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                                                                                                               meningitidis.
Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        - FTYSLKKELKDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG

    15, Created)
    15, Last sequence upon
    16, Last annotation of the company o
                                                                                                                                                                                                                                                                                                                                                                                                  beta
                                                                       Sequencing.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                  subdivision;
       8AA476AC300D80C8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     590
                                                                       Against Serogroup ing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ⋛
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        on update)
                                                                                                                                                                                                                                                                                                                                                                                                  Neisserlaceae;
       CRC64;
                                                                                                                                                                                                                                                         Arico' B
                                                                                                                                                                                                                                   Capecchi
                                                                                                                                                                                        Zuo
                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria
                                                                                                                                                                                                                Nuti
                                                                                                                                                                                             т В.,
т S.,
                                                                                                                                                                                        ₽.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             297
```

Query Match Best Local Sim Matches 514;

Similarity

85.

5 6

Score 2569.5; Pred. No. 2.1e 24; Mismatches

2.le-1

100; 2;

Indels Length

9;

Gaps

DB

590;

Conservative

24;

밁

\_ ш

60

60

Best

δõ

4.

```
RESULT
Q9JPS2
ID
Q9,
AC
QP
QP
QP
QP
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                 MEDLINE-20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecch
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., N
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPS2;
Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
EMBL; AF226379; AAF42528.1; -.
SEQUENCE 594 AA; 62114 MW; 1E2A63A78F57D7F.
                                                                                                                                                                                                                                                                                                      SEQUENCE FROM STRAIN=NGE31;
                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                              Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                         GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--SDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGSTTGQSENV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ESVARSALVLQFMIDKEGNGE---IESTGDIGWSIYYDDHNTLHGATYTLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DPVQRTVAVLIVNSDKEGTGEKEKVEENSD--WAVYFNEKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                              Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (TrEMBLrel. 15, (TrEMBLrel. 15, (TrEMBLrel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                          N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNA992.
                                                                                                                                                                                                                                                                                                                                                                                              beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Created)
Last seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                                                            subdivision;
                    1E2A63A78F53D256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sequence update)
annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₹
                                                                                                                                                                                                                                                                                                                                                                                            Neisseriaceae;
                    CRC64
                                                                                                                                                                                                         Capecchi
ra M., Nut
                                                                                                                                                                                         Zuo
                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                           chi B.,
Nuti S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59C
                                                                                                                                                                                    ₽.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     536
```

```
Вр
                                                                                                                                                                                                                                          QУ
              δÃ
                                            Qy
                                                                             Ş
                                                                                                           δÃ
                                                                                                                             밁
                                                                                                                                           δÃ
                                                                                                                                                             DЬ
                                                                                                                                                                           20
                                                                                                                                                                                            망
                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                        Ş
                                                              Вb
                                                                                             B
Дb
                               Вp
                                                                                                                                                                                                                                                                                                                           Matches
538
               533
                               478
                                               473
                                                               418
                                                                              413
                                                                                              358
                                                                                                             353
                                                                                                                              298
                                                                                                                                             293
                                                                                                                                                             238
                                                                                                                                                                             233
                                                                                                                                                                                             180
                                                                                                                                                                                                            175
                                                                                                                                                                                                                                            118
                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                          Local Similarity hes 517; Conserv
                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                           \vdash
                                                                                                                                                                                                                                                                                                         Н
                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVATAVLATLLSATVQANATDTDEDEEL
ANKPVRITNVAPGVKEGDVTNVAOLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLAQAY
                                                              MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                      TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                   ENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKG
                                                                                                                                                                                                                                                           EPVQRTAPVLSFHADSEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTD
                                                                                                                                                                                                                                                                   ESVARSALVLQFMIDKEGNGEIESTGDIGWSIYYDDHNTLHGATVTLKAGDNLKIKQ---
                                                                                              TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                             DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                       86.68; **-
                                                                                                                                                                                                                                                                                                                          Pred. No. 4.6
17; Mismatches
                                                                                                                                                                                                                                                                                                                          . 4.6e-100;
ches 52;
                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                          11;
 594
                                                                                                                                                                                                                                                                                                                         Gaps
                                               532
                                                                              472
                                                                                                             412
                                                                                                                                                                                                                            179
                                                                                                                                                                                                                                            174
                                                               477
                                                                                                                                             352
                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                           59
                                                                                                                                                                                                                                                                                                          60
                                                                                              417
                                                                                                                              357
                                                                                                                                                             297
                                                                                                                                                                             292
                                                                                                                                                                                                             232
```

Search con Job time: completed: July ne: 1162 sec ω 2002, 08:28:41

Page 10

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                           Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Perfect score:
                                                                                                                                                                                                                                                         ĕ
                                                                                                                                                                                                                                                                                                                                                          Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
  2852
2783.5
2762.5
                                                                                                                                                                                                                                                       Score
                                                               3019
3019
3019
3019
2874
2874
2855
2855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             length:
length:
                                                                                                                                                                                                                                                   Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A_Geneseq_032802:*

| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1980.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1981.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1982.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1983.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1984.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1985.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1986.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DAT:*
| SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1987.DAT:*
    100.0
100.0
95.2
95.2
94.6
94.6
94.5
94.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                    10:
11:
11:
12:
13:
14:
15:
16:
16:
17:
18:
19:
19:
20:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          July 3, 2002, 08:09:05; Search time 168.6 Seconds (without alignments) 391.328 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    747574 segs, 111073796 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 MNKIYRIIWNSALNAWVAVS......TASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-771-382-4
                                                                                                                                                                                                                                                                                                                                                                                                                                      ): /SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1989.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1999.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1991.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1992.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1993.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1993.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1995.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1995.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1997.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1997.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1999.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA1999.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA2000.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA2000.DAT: *
.SIDS1/gcgdata/hold-geneseq/geneseqp-emb1/AA2000.DAT: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2000000000
                                                                                                                                                                                                                                                         DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gapext 0.5
    222222222
                   AAY23740
AAY57044
AAU06174
AAU06179
AAY23739
AAU06179
AAU023742
AAU06178
AAU06178
AAU06178
                                                                                                                                                                                                                                                       Ħ
                                                                                                                                                                                                                                                                                                                     SUMMARIES
                 A surface protein
BASB029 amino acid
N. meningitidis EG
A surface protein
N. meningitidis BZ
A surface protein
N. meningitidis H1
A surface protein
N. meningitidis BZ
BASB029 amino acid
                                                                                                                                                                                                                                                     Description
A surface protein
```

	22.8 19.7	24.1 22.8	24.5	32.4	34.1	34.8	34.9	42.8	44.0	62.5	67.3	73.9	78.4	79.8	81.1	82.9	83.4	83.4	83.9	87.3	87.3	90.7	90.7	91.1	91.4	91.4	91.4	91.5
1992 1 1992 2				679 1 679 2																					591 2			
17 A 22 A																												
AAB69136 AAW04505 AAB69133	AAB23859 AAB37832	AAB23854	AB23857	AR99394 AB23855	AR99392	AAY27201	AAB23858	AB23860	AAR99393	AAU06184	AAU06185	AAU06181	AU06186	AAU06183	AU06182	AY27203	AAU06173	AAY23745	AAU06180	AAU06172	AAY23744	AAU06175	AAY23741	AY23737	AAU06171	AAY23746	AAY27202 .	AAU06176
M. catarrhalis Moraxella 200 M. catarrhalis	emophilus isserial c	Haemophilus influe		Haemophilus adhesi Haemophilus influe		Amino acid sequenc			Haemophilus adhes	N. meningitidis	•	•	•	N. meningitidis	N. meningitidis	Amino acid sequenc	N. meningitidis	A surface protein	•	N. meningitidis	A surface prote	N. meningitidis	A surface protein	A surface protein	۳.	P	Amino acid sequenc	N. meningitidis

## ALIGNMENTS

RESULT AAY23740

```
Neisseria meningitidis surface proteins useful for treating meningitidis infections
                        N-PSDB; AAX85792
                               WPI; 1999-418754/35.
                                                                           12-DEC-1997;
                                           Jennings MP,
                                                                                        14-DEC-1998;
                                                                                                     24-JUN-1999.
                                                                                                                  WO9931132-A1
                                                                                                                               Neisseria meningitidis
                                                       (ISIS:) ISIS INNOVATION LTD (UYQU ) UNIV QUEENSLAND.
                                                                                                                                            immunoreactive peptide.
                                           Moxon
                                                                           97GB-0026398
                                                                                        98WO-AU01031
                                           ER,
```

Surface protein; surface glycoprotein; infection; vaccine;

A surface protein of Neisseria meningitidis

08-SEP-1999 (first entry)

AAY23740

AAY23740 standard; Protein; 594

₹

```
RESULT AAY57044
ID AAY57044
ID AAY5
XX AAY5
XX AAY5
XX 21-F
DT 21-F
XX BASE
KW INFE
                                                                                                                                                                        γ
                                                                                                                                                                                             Db
                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                               δ
O
                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2 x 5 5 5 5 5 5 5 5 5 5 8 8 8 8
                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                     BASB029; Nisseria meningitidis; surface fibril protein;
                                         BASB029 amino acid
                                                             21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim
                                                                                                     AAY57044
                                                                                                                                                       541
                                                                                                                                                                           541
                                                                                                                                                                                               481
                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            _
                                                                                                                         N
                                                                                                                                                     SSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                                            TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                      DFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKGEND
                                                                                                                                                                                                                                                                                                                                                                                                               LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 dfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkdkgend
                                                                                                                                                                                                                                                                                                                                                                                                   lngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgttasdnv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                     standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                             (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            100-101;
                                        sequence
                                                                                                     Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            100.0%;
          prevent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                        from N. meningitidis strain
                                                                                                      594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 3019; DB 20;
Pred. No. 5.1e-173;
; Mismatches 0;
           antibacterial drug
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                         ATCC13090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                         480
                                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                 540
                                                                                                                                                                                                                                      480
                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                     360
                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
```

```
Qy
                                                                  Вþ
                                                                                              Qy
                                                                                                                                  DЪ
                                                                                                                                                               QΥ
                                                                                                                                                                                                 В
                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                Ър
                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                This is the Nisseria meningitidis BASB029 amino acid sequence from CC serogroup B strain ATCC13090. The BASB029 protein is homologous to the CC Haemophilus influenzae surface fibril (HSF) protein. The invention CC relates to BASB029 polynucleotide sequences (AAX39864-Z3985) and CC polypeptide sequences (AAX57044-Y57045) and their immunogenic fragments. CC BASB029 polypeptides are useful in a method of diagnosing a Neisseria CC meningitidis infection in a mammal. Compositions containing BASB029 CC polynucleotides and polypeptides are useful for generating an immune CC response in an animal. A therapeutic composition comprising an antibody CC directed against BASB029 is useful in treating humans with Neisseria CC meningitidis disease. The polynucleotide is useful in the diagnosis of CC the stage of infection, type of infection, susceptibility to an CC infection which results from increased or decreased expression of the CC polynucleotide, and for therapeutic or prophylactic purposes, CC particularly genetic immunisation. Antibodies against BASB029 CC polynucleotides and polypeptides are also useful for treating infections CC particularly bacterial infections. The protein is useful in the CC creening and development of antibacterial drugs. Fused recombinant CC creening the protein is useful for the stimulation of the immune system of an organism CC receiving the protein.
                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 594
                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         treatment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                             receiving
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                                 241
                                                                   181
                                                                                                  181
                                                                                                                                  121
                                                                                                                                                                  121
                                                                                                                                                                                                 61
                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                            polypeptide from neisseria meningitidis useful for diagnosis
NTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVH 180
                                                                                                                                                                                             PVQRTAVVLSFRSDKECTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2000-053103/04
                                                                                 LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNV 240
                                                                  lngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgttasdnv
                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                              the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         or prevention of bacterial infections in
                                                                                                                                                                                                                                                                                                                                                                                                                594 AA;
                                                                                                                                                                                                                                                                                                                             100.0%; Score 3019; DB 21; ilarity 100.0%; Pred. No. 5.1e-173; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                             protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AATC"
                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mamma l
                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                            organism
                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                60
```

B

241

300

0;

٦,

```
RESULT AAU06174
ID AAU06274
ID AAU06274
XX AAU06274
AX AAU06274
AX AAU06274
AX Neis
CON Neis

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Key
Region
                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAU06174;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAU06174 standard;
                    25-JAN-2000;
                                                        25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        pvritnvapgvkegdvtnvaqlkgvaqnlnnhidnvdgnaragiaqaiataglvqaylpg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmde
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       meningitidis strain
                    2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= '51..104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EG327 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                /label= C4
/note= "Conserved region 232..238
                                                                                                                                                                                                                                                                                                                                        /label= V3
/note= "Variable
213..231
                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= v2
/note= "variable
127..190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note= "Conserved region 117..126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Variable 105..116
                                                                                                                                                                                                                       /note= "Variable
239..594
                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Conserved
191..212
                                                                                                                                                                                                                                                             /label= V4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= C2
                                                                                                                                                                                  /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                               /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Conserved region
                                                                                                                                                                                "Conserved region
                                                                                                                                                                                                         C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EG327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        region 1"
                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                                             region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               360
```

```
meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen which is the present sequence representing the wild type surface antigen wild strain squences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WPI; 200
N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                              New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for t preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                              The present invention relates to the isolation of novel
                                                                                                                                                                                                                                                                                                                                                       Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Peak IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (UYQU ) UNIV QUEENSLAND
                                      present invention.
                                                                                                                                                                                                                                                                                                                                                         9
                                                                                                                                                                                                                                                                                                                                                     Fig 1; 91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Jennings MP
                                                                                                                                                                                                                                                                                                                                                       English
                                                                                                                                                                                                                                                                                                              Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                    treating
                                                                                                                                                                                                                                                                                                                                                                                                                                            from
```

or

Matches Query Match
Best Local Similarity Conservative 100.0%; 0; Score 3019; DB 22; Pred. No. 5.1e-173; Mismatches Indels Length 0, Gaps 0;

Sequence

594 AA;

```
Š
                    밁
                              Qy
                                              망
                                                        Qy
                                                                       В
                                                                                 δõ
                                                                                                밁
                                                                                                           Qy
                                                                                                                          밁
                                                                                                                                     Qy
                                                                                                                                                   Вþ
                                                                                                                                                              δÃ
                                                                                                                                                                             밁
                                                                                                                                                                                        Q
                                                                                                                                                                                                       밁
                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                      Ċ
       541
                    481
                                              421
                                                          421
                                                                       361
                                                                                                 301
                                                                                                             301
                                                                                                                          241
                                                                                                                                       241
                                                                                                                                                   181
                                                                                                                                                                             121
                                                                                                                                                                                          121
                                 481
                                                                                   361
                                                                                                                                                                181
                                                                                                                                                                                                      61
                                                                                                                                                                                                                   61
                                                                                                                                                                                                                               KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                            TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                       SSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA
                                                                                                                         DFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKGEND
                                                                                                                                                  PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                       tvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmde
                                                                                               {\tt sstdkgeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkgtta}
                   480
                                                                                    420
                                                                                                             360
                                                                                                                                                                                          180
                                                                                                                                                                                                                   120
                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                             60
                                 540
                                              480
                                                                       420
                                                                                                 360
                                                                                                                           300
                                                                                                                                       300
                                                                                                                                                   240
                                                                                                                                                                240
                                                                                                                                                                             180
                                                                                                                                                                                                       120
```

540

480

360

300

```
RESULT
AAY23739
Q
                                 δÃ
                                                      망
                                                                       δÃ
                                                                                                           9
                   망
                                                                                          Ъ
                                                                                                                               В
                                                                                                                                               δõ
                                                                                                                                                                                                                밁
                                                                                                                                                                    Matches 568;
                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                        The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                                                                    (UYQU)
                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY23739
                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                  be used to
                                                                                                                                                                                                                                                                                                                          Claim 1;
                                                                                                                                                                                                                                                                                                                                                                        N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                 WPI; 1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                  Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A surface protein of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAY23739;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         immunoreactive peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541
 241
                    181
                                     181
                                                       121
                                                                        121
                                                                                          61
                                                                                                             61
                                                                                                                                                 ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4
                                                                                                                             PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGYYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
DFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKGEND
                                                      NTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw 594
                                                                                         pvqrtavvlsfrsdkegtgekegtedsnwavyfdekrvlkagaitlkagdnlkikqntne
                                                                                                                                                                                                                                                                                                                                                                                                                    UNIV
USISI
                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                          Page 95-97;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        standard; Protein;
                                                                                                                                                                                                                                  identify
                                                                                                                                                                                                                 594 AA;
                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                             INNOVATION
                                                                                                                                                                                                                                                                                                                                                                                                                    QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                 Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 98WO-AU01031
                                                                                                                                                                          95.28;
95.68;
                                                                                                                                                                                                                               immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                        132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                              LTD
                                                                                                                                                                                                                                                                                                                                                                                                   Peak IRA;
                                                                                                                                                                   <u>ن</u>
                                                                                                                                                                                                                                                                                                                          English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        594 AA
                                                                                                                                                                  Score 2874; Di
Pred. No. 2.5e
5; Mismatches
                                                                                                                                                                                                                                                                                                                                                    proteins useful
                                                                                                                                                                  DB 20;
2.5e-164;
nes 21;
                                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                                   Indels
                                                                                                                                                                                   Length 594;
                                                                                                                                                                                                                                                                                                                                                    treating
                                                                                                                                                                                                                                                                      humans
                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                    z
                                                                                                                                                                 Gaps
                                   240
                                                                        180
                                                                                          120
                                                                                                                               60
                                                                                                                                                 60
                                                      180
                  240
                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
AAU06179
ID AAU0
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                       Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                             AAU06179 standard; Protein;
         25-JAN-2001;
                            02-AUG-2001.
                                             WO200155182-A1
                                                                                                             Region
                                                                                                                                       Region
                                                                                                                                                                   Region
                                                                                                                                                                                              Region
                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis strain BZ198
                                                                                                                                                                                                                                                                                                                                                    Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                        24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                           AAU06179;
                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                              G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      {\tt sstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkgtta}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tvninagnnieitrngknidiatsmapqfssvslgagadaptlsvddegalnvgskdtnk
         2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                                                                                      BZ198 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                   /note= "\
105..116
                                                                                                             /label= C4
/note= "Conserved
232..238
                                                                                                                                         213..231
                                                                                                                                                                                                      /label= V2
/note= "Variable
                                                                        /label=
                                                                                          'note- "Variable
                                                                                                    /label=
                                                                                                                                                 note= "Variable"
                                                                                                                                                           /label=
                                                                                                                                                                           /label= C3
/note= "Conserved
                                                                                                                                                                                                                                 note= "Conserved"
                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                     /label= V1
                                                                                                                                                                                                                                                                                     /note=
                                                                                                                                                                                                                                                                                                                ocation/Qualifiers
                                                                                                                                                                                                                                                                                               label=
                                                                                                                                                                                              ..190
                                                                                                                                                                                                                                                           "Variable region
                                                                                                                                                                                                                                                                                       "Conserved
                                                               "Conserved region
                                                                          C5
                                                                                                     ٧4
                                                                                                                                                           ٧3
                                                                                                                                                                                                                                                                                                C
                                                                                                                                                                                                                                                                                                                                                                                                                             594 AA
                                                                                          region
                                                                                                                                                                                                      region
                                                                                                                                                 region
                                                                                                                     region
                                                                                                                                                                            region
                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                        2
```

Qy

541

594

```
멍
                                                                                                                                                                                                                                                                                                                                                                            80
                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOX CCCCCCCCCCCCXX
                                                                                                                  В
                                                                                                                                          δÃ
                                                                                                                                                                          В
                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                    , B
                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ρ
                         Ş
                                                         В
                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches 568;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain BZ198 is 1 of 10 NhhA polypeptide sequences (AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treat. preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                   121
   481
                            481
                                                          421
                                                                                     421
                                                                                                                  361
                                                                                                                                               361
                                                                                                                                                                           301
                                                                                                                                                                                                     301
                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               present invention.
                                                                                                                                                                                                                               MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
               PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                      TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK
                                                                                                                                TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                      SSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                        PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \verb|mnkiyriiwnsal| nawvvvseltrnhtkrasatvatavlatll fatvqanatdddlyle|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2001-488774/53
                                                                                                               tvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskgkmde
                                                                                                                                                                        sstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgkgtta
                                                                                                                                                                                                                                                                                                                                                                                                         pvqrtavvlsfrsdkegtgekegtedsnwavyfdekrvlkagaitlkagdnlkikqntne
pvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqaylpg
                                                         tvninagnnieitrngknidiatsmapqfssvslgagadaptlsvddegalnvgskdtnk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ٥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1; 91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         95.2%;
95.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             seful in producing vaccines for treating of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2874; DB 22; Pred. No. 2.5e-164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            or
                            540
                                                                                     480
                                                                                                                  420
                                                                                                                                             420
                                                                                                                                                                                                    360
                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                         480
                                                                                                                                                                        360
                                                                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
```

```
RESULT
AAY23742
ID AAY2
                                                                                             Qy
                                                                                                                                                                                                          δÃ
                                       밁
                                                         γQ
                                                                             멍
                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                          Matches 566;
                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A surface
                                                                                                                                                                                                                                   The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especia in the form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                              The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis
                                                                                                                                                                                                                                                                                                                           Claim 1;
                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis surface proteins meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                        Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAY23742;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAY23742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis
                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                           in the form of vacci
be used to identify
                                                                                                                                                                                                                                                                                                                                                                                                                         VIND ( DOYD)
                                                                                                                                                                                                                                                                                                                                                                                                                                                         12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Surface protein;
immunoreactive po
  181
                    177
                                       121
                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              541
                                                                             61
                                                                                                 61
                                                                                                                  σ
1999-418754/35.
DB; AAX85794.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ksmmaiggdtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                     PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
                                                                            {\tt pvqrtavvlsfrsd} kegtgekegtedsnwavyfdekrvlkagaitlkagdnlkik{\tt qntne}
                                                                                                                                                                                                                                                                                                                           Page 108-110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              standard; Protein; 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein of Neisseria meningitidis.
                                                                                                                                                                                                          598
                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                    INNOVATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first
                                                                                                                                                                                                                                                                                                                                                                                                                           QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                         Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                         97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 surface
                                                                                                                                                                                                                                                                                                                                                                                                         ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       entry)
                                                                                                                                                                                                                            immunoreactive
                                                                                                                                                                  94.6%;
                                                                                                                                                                                                                                                                                                                          132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                     LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                          Peak
                                                                                                                                                         6;
                                                                                                                                                                 Score
Pred.
                                                                                                                                                                                                                                                                                                                           English.
                                                                                                                                                                                                                                                                                                                                                                                                          IRA;
                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA
                                                                                                                                                                  2855;
No. 3
                                                                                                                                                                                                                           peptides.
                                                                                                                                                        DB 20;
3.4e-163;
hes 22;
                                                                                                                                                                                                                                                                                                                                                         useful
                                                                                                                                                                                                                                                                                                                                                          for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  vaccine;
                                                                                                                                                                            Length
                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                        treating
                                                                                                                                                                                                                                     especially can also
                                                                                                                                                                                                                                                                   humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               594
                                                                                                                                                          4
                                                                                                                                                                                                                                                                                                                                                         z
                                                                                                                                                          Gaps
                    236
                                       180
                                                           176
                                                                               120
                                                                                                                    60
   240
                                                                                                                                       60
```

1;

```
RESULT
AAUGGIT7
JD AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AAUGGIT7
AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                      02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Surface antigen NhhA; meningococcal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAU06177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAU06177
                                                                                                                                                                                  Region
                                                          WO200155182-A1
                                                                                                                               Region
                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DANKPYRITNVAPGYKEGDYTNVAQLKGYAQNLNNHIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          dankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglaqa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                      /note= "Variable region 4
243..598
/label= C5
/note= "Conserved ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             H15 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note=
51..10
                                                                                                                                                                                /note= "Conserved
236..242
                                                                                                                                                                                                                                         /label= V3
/note= "Variable
217..235
                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Conserved
117..130
                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note= "Variable
105..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                    131..194
                                                                                                                                                                                                                                                                                                                                                                 /label= V2
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label=
                                                                                                                                                                                                                        /label=
                                                                                                                                                                                                                                                                                             195
                                                                                                                                                                                                                                                                                                            note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                                                               'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Protein;
                                                                                                                                                                                                                                                                                             216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ជ
                                                                                                                                                                                                                          C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         н15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           region
                                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                            region
                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           disease; meningitis vaccine
                                                                                                                                                  4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 30C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             356
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                         В
                                                                                                 QΥ
                                                                                                                        뫄
                                                                                                                                                  δÃ
                                                                                                                                                                              밁
                                                                                                                                                                                                     Š
                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                       20
                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhA from N. meningitidis strain H15 is 1 of 10 NhA polypeptide sequence: (AAU06171-AAU06180) from 10 different N. meningitidis strains given
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-JAN-2001;
                         421
                                                                          361
                                                                                                  357
                                                                                                                           301
                                                                                                                                                      297
                                                                                                                                                                            241
                                                                                                                                                                                                     237
                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                        177
                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity hes 566; Conser
                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                  present
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            present
                                                                                                                                                                                                                            2001-488774/53
)B; AAS09167.
DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA
                                                                         gttatvskddggnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskg
                                                                                      GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                           dengsstdegeglvtakevidavnkagwrmktttanggtgqadkfetvtsgtkvtfasgn
                                                                                                                                        GENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                              sdnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgklvtgkgk
                                                                                                                                                                                          SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                               NTNA - - -
                                                                                                                                                                                                                                                                                                                                                            PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9; Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               invention
                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2001WO-AU00069
                                                                                                                                                                                                                                                                                             -SSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ¥
                                                                                                                                                                                                                                                                                                                                                                                                                                                  94.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             relates to
                                                                                                                                                                                                                                                                                                                                                                                                                                      6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 2855; DB 22; Pred. No. 3.4e-163;
                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             isolation of novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             treating
                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                   476
                                                                                                                                                      356
                                                                                                                                                                               300
                                                                                                                                                                                                        296
                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                         236
                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              or
                          480
                                                                           420
                                                                                                                              360
```

۳.

1

Ş 망

밁

480 476 420 416

356 360

300 296 240

```
AAX23738
IID AAY2
XX AAY2
AC AC ACAC
AC AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC ACC
AC A
                            В
                                                                                                                        δÃ
                                                                                                                                                             ₽
                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                           Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                         The
                                                                                                                                                                                                                                                                                                                                                                                                    The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24 - JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A surface protein of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAY23738;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAY23738 standard;
                                                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                     prevent or treat N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VINU ( UQYU) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
   177
                                 121
                                                               121
                                                                                             61
                                                                                                                             61
                                                                                                                                                             ب
                                                                                                                                                                                                                                                                                                                                      N. meningitidis surface glycoproteins can also be used vent or treat N. meningitidis infection in humans, especthe form of vaccines. The proteins and antibodies can alused to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          æ
                                                                                                                                                         MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1999-418754/35
DB; AAX85790.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                          YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       dankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglaqa 540
                            nt nent ndssfty slkkdltdlts veteklsf gangnkvnits dtkgln faket agtngd\\
                                                               NTNA---
                                                                                                                                                                                                                           566;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1; Page 91-93; 132pp;
                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MP,
                                                                                                                                                                                                                                                                                                           598
                                                                                                                                                                                                                            Conservative
                                              -SSFTYSLKKDLTDLTSVGTEKLSESANSNKVNITSDTKGLNFAKKTAETNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              n; surface glycoprotein; infection; peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ER,
                                                                                                                                                                                                                                           94.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            598
                                                                                                                                                                                                                            5
                                                                                                                                                                                                                         Score 2852; DB 20;
Pred. No. 5.2e-163;
5; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             vaccine;
                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                       especially
                                                                                                                                                                                                                                                            598;
                                                                                                                                                                                                                                                                                                                                                        also
                                                                                                                                                                                                                                                                                                                                                                                                     humans.
                                                                                                                                                                                                                           4 ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           598
                                                                                                                                                                                                                           Gaps
 236
                               180
                                                             176
                                                                                               120
                                                                                                                               120
                                                                                                                                                             60
                                                                                                                                                                                           60
                                                                                                                                                                                                                            ۳
RESULT
AAUO6178
AAUO6178
AAUO6178
AC AAUC
XX AAUC
DT 24-C
DT 24-C
DX Neis
XX Neis
XX Regi
FT Regi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Key
Region
                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Surface antigen NhhA; meningococcal disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAU06178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAU06178
                WO200155182-A1
                                                                                                                                                                                                                           Region
                                                                                                                             Region
                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DANKPYRITNVAPGVKEGDYTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtkvtfasgn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENDSSTDKGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkgk\\
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglaqa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BZ10 surface
                                              /label=
/note= "
                                                                           /label= V4
/note= "Variable region
243..598
                                                                                                                                                                            /label= V3
/note= "Variable
217..235
                                                                                                                                                                                                                                                                                                                                                                       /label- V1
/note- "Variable region
105..116
                                                                                                                                236..242
                                                                                                                                                                                                                                                                                                                             /note=
117..1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label=
                                                                                                                                                             /label=
                                                                                                                                                                                                                            195..216
                                                                                                                                                                                                                                                                                          /label= V2
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                     note-
                                                                                                                                              note= "Conserved"
                                                                                                                                                                                                                                           note= "Conserved
                                                                                                                                                                                                                                                          'label=
                                                                                                                                                                                                                                                                                                                                                        'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Protein;
                                                                                                                                                                                                                                                                                                                            . 130
                                                                                                                                                                                                                                                                             194
                                                                                                                                                                                                                                                                                                                                         "Conserved
                                                  "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                       "Conserved
                                                                                                                                                                C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                         C
                                                               C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BZ10.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                                                                                                                       region
                                                region
                                                                                                                                              region
                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NhhA polypeptide sequence.
                                                                                                 4,
                                                                                                                                                                                                                                                                                                                                            2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   meningitis vaccine
```

δõ

δÃ B Ş

```
δÃ
                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                      ρy
                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                  Qy
 В
                       Qy
                                                   밁
                                                                                                       В
                                                                                                                            Q
                                                                                                                                                            밁
                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                               Вр
                                                                                                                                                                                                                                                                                                                                                                                                       Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The present invention relates to the isolation of novel Nelsseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06185). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-JAN-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The present sequence representing the wild type surface antigen Nhha
from N. meningitidis strain BZ10 is 1 of 10 Nhha polypeptide sequences
(AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (UYQU ) UNIV
                         417
  421
                                                                                                                                                              241
                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                           177
                                                                                                                                                                                                                                                                        121
                                                   361
                                                                              357
                                                                                                        301
                                                                                                                                  297
                                                                                                                                                                                        237
                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                         ш
                                                                                                                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             present
                                                TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                  NTNA----SFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD
kmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddegalnvgsk
            KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                                                                                                                            sdnvdfvrtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkgk
                                                                                                                                                                                       SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                               ptvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtta
                                                                                                                                                                                                                                                                    ntnentndssftyslkkdltdltsveteklsfgangnkvnitsdtkglnfaketagtngd
                                                                                                                                                                                                                                                                                                                         pvqrtavvlsfrsdkegtgekegtedsnwavyfdekrvlkagaitlkagdnlkikqntne
                                                                                                                                                                                                                                                                                                                                       PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
                                                                                                                                                                                                                                                                                                                                                                                                                                     566;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2001-488774/53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Jennings MP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                              94.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               English.
                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2852;
Pred. No. 5.
5; Mismatche
                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 22;
.2e-163;
                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                  4;
                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                356
                                                                                                                                                                                                                                           236
                                                                                                                                                                                                                                                                                                                                                                               60
                                                   420
                                                                                                                                                              300
                                                                                                                                                                                     296
                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                                          120
                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                  1;
```

```
RESULT 1
ANY57045
ID ANY57045
XX ANY5
XX BASH
XX BASH
XX BASH
XX BASH
XX Neis
FH Key
FH Misc
F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
This is the Nisseria meningitidis BASB029 amino acid sequence from serogroup B strain H44/76. The BASB029 protein is homologous to the Haemophilus influenzae surface fibril (HSF) protein. The invention relates to BASB029 polynucleotide sequences (AAZ39864-Z39865) and polypeptide sequences (AAY57044-Y57045) and their immunogenic fragments. BASB029 polypeptides are useful in a method of diagnosing a Neisseria meningitidis infection in a mammal. Compositions containing BASB029 polynucleotides and polypeptides are useful for generating an immune response in an animal. A therapeutic composition comprising an antibody directed against BASB029 is useful in treating humans with Neisseria meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note-
Misc-difference 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note=
Misc-difference 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                                                                                                                                                                                                         Claim 4; Fig 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BASB029; Nisseria meningitidis; surface fibril protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY57045;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAY57045
                                                                                                                                                                                                                                                                                                                                                                                                           treatment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (SMIK ) SMITHKLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10
                                                                                                                                                                                                                                                                                                                                                                                                        polypeptide from neisseria meningitidis useful for atment or prevention of bacterial infections in mamm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ylpgksmmaigggtyrgeagyaigyssisdtgnwvikgtasgnsrghfgtsasvgyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2000-053103/04.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglaqa 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAZ39865
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               treatment; prevent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98GB-0010276.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                       74pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note=
269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Encoded by AATC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          from N. meningitidis strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 antibacterial drug
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ьy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGT"
                                                                                                                                                                                                                                                                                                                                                                                                                               diagnosis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         HSF; diagnosis;
```

```
RESULT 11
AAX73743
ID AAX237
XX
AC AAY237
XX
DE ASULT
DE A SULT
XX
SULTAC
KW immuno
XX
PN WO9931
XX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029 polynucleotides and polypeptides are also useful for treating infect particularly bacterial infections. The protein is useful in the screening and development of antibacterial drugs. Fused recombinant protein is useful for the stimulation of the immune system of an org
                                                                                A surface protein
                                                                                                    08-SEP-1999
                                                                                                                        AAY23743;
                                                                                                                                             AAY23743 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                              Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         receiving the protein.
                                                  immunoreactive
                                                                                                                                                                                                                                        474
                                                                                                                                                                                                                                                            477
                                                                                                                                                                                                                                                                                 415
                                                                                                                                                                                                                                                                                                    417
                                                                                                                                                                                                                                                                                                                         355
                                                                                                                                                                                                                                                                                                                                            357
                                                                                                                                                                                                                                                                                                                                                                 295
                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                          235
                                                                                                                                                                                                                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                                                                                                                                                                                   175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Match
                                                                                                                                                                                                         YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                 DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA 536
                                                                                                                                                                                                                                                                             YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD---DDDL
                                                                                                                                                                                                                                                                                                                       gttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskg
                                                                                                                                                                                                                                                                                                                                  GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 yldpvqrtvavlivnsdkegtgekekveedsnwavyfdekgvltareitlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mnkiyriiwnsalnawvavseltrnhtkrasatvktavlatllfatvqasanneeqeedl
                                                                                                                                                                                               ylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                       kdnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqa
                                                 protein; surface 
eactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                   (first entry)
                                                                                of Neisseria meningitidis
                                                                                                                                             Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             92.2%;
                                                            glycoprotein;
                                                                                                                                             599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2783.5;
Pred. No. 6.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                             B
                                                            infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5e-159;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of an organism
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    infections
                                                                                                                                                                                                                  594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                473
                                                                                                                                                                                                                                                                                                                                                                                    356
                                                                                                                                                                                                                                                                                                                                           416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                57
                                                                                                                                                                                                                                        533
                                                                                                                                                                                                                                                                                                                        414
                                                                                                                                                                                                                                                                                                                                                                354
                                                                                                                                                                                                                                                                                                                                                                                                         294
                                                                                                                                                                                                                                                                                                                                                                                                                              296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4
```

```
DЪ
               õ
                                  B
                                                  Ş
                                                                    밁
                                                                                    Q
                                                                                                       멍
                                                                                                                      Q
                                                                                                                                          밁
                                                                                                                                                         Q
                                                                                                                                                                             В
                                                                                                                                                                                           Qy
                                                                                                                                                                                                              망
                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 549; Conserv
                                                                                                                                                                                                                                                                                                                                                                                  surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present sequence meningitidis which is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (ISIS-) ISIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12-DEC-1997;
481
                                   421
                                                                     361
                                                                                                        301
                                                                                                                         296
                                                                                                                                          241
                                                                                                                                                                              181
                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                    KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQ
                                epvvrsalvlqfmidkegngenestgnigwsiyydnhntlhgatvtlkagdnlkikqntn
                                                                                                                                                                                                                                                            EPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ---
kdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Page 114-115; 132pp;
                                                                                                                                                                                                                                                                                                                                                                   599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QUEENSLAND.
                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                se represents a surface protein of Neiserria is approximately 62 kDa. The N. meningitidi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ER,
                                                                                                                                                                                                                                                                                                                               91.5%;·
91.7%;
                                                                                                                                                                                                                                                                                                                        13;
                                                                                                                                                                                                                                                                                                                                Score 2762.5; DB Pred. No. 1.2e-157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    proteins useful
                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                 The N. meningitidis
                                                                                                                                                                                                                                                                                                                                        20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for
                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     treating
                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                        5
                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                     60
                                    480
                                                                      420
                                                                                       415
                                                                                                                                           300
                                                                                                                                                                              240
                                                                                                                                                                                                                                                                    116
                                                                                                        360
                                                                                                                          355
                                                                                                                                                             295
                                                                                                                                                                                                                 180
```

Š

536

AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW

В

541

599

2;

```
RRESULT 1
AAUGA176
ID AAUGA AA
                  The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                  New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAU06176;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAU06176
                                                                                                                                               Claim
                                                                                                                                                                                                                                                                         N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                               25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     25-JAN-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Regior
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Surface antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                               IRA,
                                                                                                                                                                                                                                                                    2001-488774/53.
DB; AASO9166.
                                                                                                                                                                                                                                                                                                                                                                         UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             standard;
                                                                                                                                            Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis strain
                                                                                                                                                                                                                                                                                                                             Jennings MP;
                                                                                                                                               ļ.
                                                                                                                                                                                                                                                                                                                                                                         QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                               2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                       2001WO-AU00069
                                                                                                                                          91pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NhhA; meningococcal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H38 surface antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note= "Variable
244..599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label= C4
/note= "Conserved
237..243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note=
132..1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= V4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= V3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      note= "Conserved"
196..217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= V2
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'note≖ "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             . . 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   50
                                                                                                                                            English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ω
                                                                                                                                                                                                       treating
                                                                                                                                                                                                         or
```

```
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                         RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                               Neisseria
bacterial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effective immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen what from N. meningitidis strain H38 is 1 of 10 NhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given it was a specific property of the present of the present of the present of the present sequence representing the wild type surface antigen NhA from N. meningitidis strains given it was a property of the present 
                                                                                                                                                                        24-SEP-1999
                                                                                                                                                                                                                                                              AAY27202 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the
                                                                                                                              Amino
                                                                                                                                                                                                                   AAY27202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                  536
                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         416
                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   y Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                         13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mnkiyriiwnsalnawvavseltrnhtkrasatvktavlatllfatvqanatdedeeeel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL
                                                                                                                                                                                                                                                                                                                                                                                              AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gkmdetvninagnnieitrngknidiatsmtpqfssvslgagadaptlsvddkgalnvgs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cal Similarity
549; Conserv
                                                                                                                                                                                                                                                                                                                                                                        aylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQ 535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            asdnvdfvhtydtveflsadtktttvnveskdngkrtevkigaktsvikekdgklvtgkg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ--- 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 kgttatvskddqgnitvkydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspsk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        epvvrsalvlqfmidkegngenestgnigwsiyydnhntlhgatvtlkagdnlkikqntn 120
                                                                                                                              acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                           kdankpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvq
                                                               meningitidis protein; infection; treatment.
                                                                                                                              sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                        (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ΑĄ;
                                                                                                                                                                                                                                                              Protein;
                                                                                                                              of
                                                                                                                                                                        entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   91.5%;
91.7%;
                                                                                 protein;
                                                                                                                              N. meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13;
                                                                                                                                                                                                                                                              591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 2762.5; DB 2
Pred. No. 1.2e-157;
3; Mismatches 32;
                                                                                   pharmaceutical;
                                                                                                                                                                                                                                                              A
                                                                                                                              protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 22;
                                                                                                                                  ORF40-1.
                                                                                       vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                     diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 effectively
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                  594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                             540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       295
```

Neisseria

meningitidis

```
SOXCCCCCCXXXXIII
                                                                                                                                                    Q
                                                                                                                                                                                            Š
                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                       В
                δ
                                          Вb
                                                            δõ
                                                                                      망
                                                                                                       δÃ
                                                                                                                                밁
                                                                                                                                                                           ₽
                                                                                                                                                                                                                                                                                                                                                                         QΥ
 몽
                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                09-OCT-1998;
14-JAN-1998;
01-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The invention provides proteins (AAY27201-245) from Neisseria meningitidis (Strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g., vaccine composition or a diagnostic composition. The composition is also useful for treating or preventing an infection due to Neisserial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 New protein and its nucleotide sequence, useful in vacadiagnostic compositions for treating and/or preventing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Grandi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14-JAN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             bacteria,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WO9936544-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (CHIR-)
                                                                                                                                                                                                                        175
                                                                                                                                                                                                                                             177
                                                                                                                                                                                                                                                                  121
  474
                      477
                                                                 417
                                                                                       355
                                                                                                                                 295
                                                                                                                                                                            235
                                                                                                                                                                                                 237
                                                                                                                                                                                                                                                                                        117
                                                                                                          357
                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                  58
                                                                                                                                                                                                                                                                                                                                                                            1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD---DDDL
                                                                                                                                                                                                                                                               1999-444400/37
                                                                                                                                                                                                                    GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                           GENDSSTDKGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                     SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                                                                       YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
kdnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiaqaiataglvqa
         DANKPVRITNVAPGVKEGDVINVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA
                                                                                   gttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskg
                                                                                                                               gengsstdegeglvtakevidavnkagwrmktttanggtggadkfetvtsgtnvtfasgk
                                                                                                                                                                          sdnvdfvrtydtveflsadtktttvnveskdngkktevkigaktsvikekdgklvtgkdk
                                                                                                                                                                                                                                                                                                          yldpvqrtvavlivnsdkegtgekekveensdwavyfnekgvltareitlkagdnlkikq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1; Page 62;
                                                                                                                                                                                                                                                                                                                                                                                                  11 Similarity 92.: 552; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  G,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CHIRON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            especially Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                         591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Masignani
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98GB-0022143.
98GB-0000760.
98GB-0019015.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SPA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           99WO-IB00103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  123pp;
                                                                                                                                                                                                                                                                                                                                                                                                           91.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pizza
                                                                                                                                                                                                                                                                                                                                                                                                Score 2758.5; DB 2
Pred. No. 2e-157;
4; Mismatches 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rappuoli R,
                                                                                                                                                                                                                                                                                                                                                                                                                      DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scarlato
                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    vaccines or
ting Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۷,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAAx>,_
, nucleic acı.
, als, e.g. a
                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                          473
                                                                                                                                354
                                                                                                                                                      356
                                                                                                                                                                           294
                                                                                                                                                                                                 296
                                                                                                                                                                                                                      234
                                                                                                                                                                                                                                           236
                                                                                                                                                                                                                                                                 174
                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                           57
                                                                                                                                                                                                                                                                                                                                                                                                  4;
```

```
RESULT 14
AAY23746
ID AAY237
XX AAY237
XX AAY237
XX Surfac
COS Neisse
XX Weisse
XX Weisse
XX Weisse
PN W09931
XX 12-DEC
XX 12-DEC
XX UPI;
DR 12-DEC
XX WFI;
DR 12-DEC
XX PT 14-DEC
XX PT 12-DEC
XX CISIS-
PA (UYQU
XX Jennin
XX WFI;
DR N-PSDI
XX WFI;
DR N-PSDI
XX WFI;
CC The p:
CC The p:
CC The p:
CC The d.
CC Treve
CC preve
CC preve
CC preve
CC preve
CC preve
CC preve
CC be us
XX Seque
                                                     γ
                                                                             Ъ
                                                                                               20
                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
         Q
                                 В
                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                       Matches
                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to
                                                                                                                                                                                                                                           prevent or treat N. meningitidis infection in humans, espec in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                          WPI; 1999-418754/35
N-PSDB; AAX85798.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (ISIS-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Surface protein; surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A surface protein of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAY23746;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAY23746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               177
                                  121
                                                                                                                                                                       Local Similarity
hes 552; Conserv
                                                                             61
                                                                                                   58
                                                                                                                          _
                                                                                                                                               1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD---DDDL
TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                           UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                             MP,
                                                                                                                                                                                                                                                                                                                                                                    Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          standard;
                                                                                                                                                                                                                               591
                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INNOVATION QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                   127-128; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Moxon
                                                                                                                                                                                                                               Ā
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein;
                                                                                                                                                                                91.48;
92.38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          591
                                                                                                                                                                               Score 2758.5; DB Pred. No. 2e-157;
                                                                                                                                                                                                                                                                                                                                                                   English.
                                                                                                                                                                                                                                                                                                                                                                                                     proteins useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                        Mismatches
                                                                                                                                                                       21;
                                                                                                                                                                                             20;
                                                                                                                                                                                                                                                                                                                                                                                                      for
                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                      treating
                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                           used to especially
                                                                                                                                                                       11;
                                                                                                                                                                                                                                                                                                  humans.
                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        594
                                                                                                                          60
                                  174
                                                         176
                                                                             120
                                                                                                                                                 57
```

```
ARESULTA
AAUGGITA
ID AAUG
XX AAUG
XX AAUG
XX CAL
DDT 24-1
XX Sur
XX Sur
XX Sur
XX Nei.
XX Nei.
XX Reg
FT Reg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                               N. meningitidis
                                                                                                                                                                                                                                                                                                                                AAU06171;
Region
                                               Regior
                                                                                                                     Region
                                                                                                                                                                            Protein
                                                                                                                                                                                                   Region
                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                 24-OCT-2001
                                                                                                                                                                                                                                                                                                                                               AAU06171
                        Region
                                                                      Region
                                                                                             Region
                                                                                                                                             Region
                                                                                                                                                                                                                                         Peptide
                                                                                                                                                                                                                                                                 Neisseria
                                                                                                                                                                                                                                                                                                                                                                                      534
                                                                                                                                                                                                                                                                                                                                                                                                     537
                                                                                                                                                                                                                                                                                                                                                                                                                    474
                                                                                                                                                                                                                                                                                                                                                                                                                                                    415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                175
                                                                                                                                                                                                                                                                                                                                                                                                                                   477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 297
                                                                                                                                                                                                                                                                                                                                                              15
                                                                                                                                                                                                                                                                                                                                                                                    kdnkpvritnvapgvkegdvtnvaqlkgvaqnlnnridnvdgnaragiagaiataglvqa
                                                                                                                                                                                                                                                                                                                                                                                                                          DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gttatvskddqgnitvmydvnvgdalnvnqlqnsgwnldskavagssgkvisgnvspskg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ttvhlngigstltdtllntgattnvtndnvtddekkraasvkdvlnagwnikgvkpgtta
                                                                                                                                                                                                                                                                                                                                                                                                     YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                               standard;
                                                                                                                                                                                                                                                                 meningitidis strain PMC21
                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                NhhA;
/note= "\
237..591
                                                                                                                                                                   52..591
/label=
                                                                                                                                                                                                                                                                                               PMC21 surface antigen NhhA polypeptide sequence
                                               /note= "Variable 211..229
                                                                                                                                                                                                 /label= C1
/note= "Conserved region
51..108
                                                             /label=
                        /note= "Conserved 230..236
                                                                                                                     /note=
121..1
                /label= V4
                                       /label=
                                                                      /note= "Conserved
189..210
                                                                                               125. .188
                                                                                                     /label= V2
/note= "Variable
                                                                                                                                   /label=
                                                                                                                                             109..120
                                                                                                                                                            /note=
                                                                                      /label=
                                                                                                                                                                                   /note= "Variable region
                                                                                                                                                                                                                                 /label= Signal_peptide
                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                               Protein;
                                                                                                                      124
                                                                                                                                                                                                                                                                                 meningococcal
                                                                                                                                                   "Predicted claimed in
       "Variable region 4"
                                                                                                                             "Conserved
                                         C4
                                                                                                                                      C2
                                                                                                                                                                   Mature_NhhA
                                                                                                                                                                                                                                                                                                                                               591
                                                                                                                                                                                                                                                                                                                                               A
                                                      region
                                                                                                      region
                                                                                                                                                    mature
claim 1
                                region
                                                                             region
                                                                                                                             region
                                                                                                                                                                                                                                                                                disease; meningitis
                                                                                                      Ŋ
                                                                                                                                                     e protein, specifically 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   476
                                                                                                                                                                                                                                                                                                                                                                                                                                                   473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               234
```

δÃ

В

355 357 295 297 235 237

416

354

294

GENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK 356

gengsstdegeglvtakevidavnkagwrmktttangqtgqadkfetvtsgtnvtfasgk

SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK

120

174 176 60

57

4

QΥ

DЬ δÃ

Вb

```
Q
                                                                                 δã
                                                                                                                В
                                                                                                                                         QΥ
                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                             В
                                                          망
                                                                                                                                                                     В
                                                                                                                                                                                                                         Query Match
Best Local S
Matches 552
                                                                                                                                                                                                                                                                                                                                  The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen NhA from N. meningitidis strain pMC21 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peak
                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                          the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OQYO)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             25-JAN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       25-JAN-2001;
     175
                               177
                                                          121
                                                                                     117
                                                                                                                61
                                                                                                                                          58
                                                                                                                                                                       1
                                                                                                                                                                                                1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD----DDDL
TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 236
                                                                                                               YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ 116
                                                                                                                                                                    ----ngtnftyslkkdltdltsvgteklsfsangnkvnitsdtkglnfaketagtngd
                                                                       NTNENTNASSETYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ) UNIV QUEENSLAND
                                                                                                                                                                                                                           552;
                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAS09161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Jennings
                                                                                                                                                                                                                                                                                               591
                                                                                                                                                                                                                                                                                                                          invention.
                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2000us-0177917
                                                                                                                                                                                                                                                                                               A
A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MP
                                                                                                                                                                                                                                        91.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        G
                                                                                                                                                                                                                          14;
                                                                                                                                                                                                                          Score 2758.5;
Pred. No. 2e-1
4; Mismatches
                                                                                                                                                                                                                                        3.5; DB 22;
2e-157;
                                                                                                                                                                                                                           21;
                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                           11;
                                                                                                                                                                                                                          Gaps
```

or

Searc Job t	дь <i>9</i>	Db Qy	Qу
Search completed: July 3, 2002, 08:09:07 Job time: 493 sec	534 ylpgksmmaigggtyrgeagyaigyssisdggnwiikgtasgnsrghfgasasvgyqw 591	477 DANKPYRITHVAPGYKEGDYINVAQLKGVAQNLNNHIDNYDGNARAGIAQAIATAGLVQA 536	417 KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 476 

THIS PAGE BLANK (USPTO)

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB
                                                  2762.5
2758.5
2758.5
2758.5
2751
2751
2739.5
2739.5
2739.5
2636
2636
2516.5
2516.5
1328.5
1328.5
                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
                                                                                                                                                                                                                                                                                                              3019
3019
2874
2874
2855
2855
2855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         seq
seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Issued_Patents_AA:*
1: /cgn2_6/ptodata/2,
2: /cgn2_6/ptodata/2,
3: /cgn2_6/ptodata/2,
4: /cgn2_6/ptodata/2,
5: /cgn2_6/ptodata/2,
6: /cgn2_6/ptodata/2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                     Query
Match
                                                 100.0
100.0
95.2
95.2
94.6
94.5
94.5
91.5
91.5
91.4
91.1
91.1
91.1
91.1
91.1
91.1
91.2
91.3
91.4
91.3
91.4
91.4
91.4
91.4
91.4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-771-382-4
3019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       July 3, 2002, 08:10:15; Search time 64.11 Seconds (without alignments) 226.311 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  231628 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 MNKIYRIIWNSALNAWVAVS....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version
Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/BCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                     Length DB
      24425594 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapext 0.5
 US-09-377-155-9
US-09-66-974-9
US-09-377-155-7
US-09-66-974-7
US-09-377-155-13
US-09-66-974-155-13
US-09-66-974-155-15
US-09-66-974-155-21
US-09-66-974-21
US-09-377-155-21
US-09-66-974-17
US-09-377-155-17
US-09-66-974-17
US-09-66-974-17
US-09-66-974-17
US-09-66-974-17
US-09-66-974-17
US-09-66-974-17
US-09-66-974-17
US-09-377-155-33
US-09-373-155-33
US-09-373-35-347-47
US-09-268-347-36
US-09-268-347-36
US-09-268-347-36
US-09-268-347-36
                                                                                                                                                                                                                                                                                                                                                                                                                                     Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Compugen Ltd
Sequence 9, Appli
Sequence 7, Appli
Sequence 7, Appli
Sequence 13, Appli
Sequence 13, Appli
Sequence 15, Appli
Sequence 15, Appli
Sequence 15, Appli
Sequence 21, Appli
Sequence 21, Appli
Sequence 21, Appli
Sequence 11, Appli
Sequence 11, Appli
Sequence 11, Appli
Sequence 19, Appli
Sequence 19, Appli
Sequence 19, Appli
Sequence 19, Appli
Sequence 33, Appli
Sequence 33, Appli
Sequence 33, Appli
Sequence 34, Appli
Sequence 37, Appli
Sequence 38, Appli
Sequence 38, Appli
Sequence 39, Appli
Sequence 39, Appli
Sequence 31, Appli
Sequence 31, Appli
Sequence 32, Appli
Sequence 33, Appli
Sequence 34, Appli
Sequence 36, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                   Description
   δõ
                                  밁
                                                             Q
                                                                                             밁
                                                                                                                     δÃ
                                                                                                                                                       В
                                                                                                                                                                                  Qy
                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 9, Application US/09377155 Patent No. 6197312
    SSTDKGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA
```

Result

ŏ

## ALIGNMENTS

Minimum Maximum

Database

Sequence:

Run on:

GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: WOXON, E. Richard
APPLICANT: WOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT FILING DATE: 199-08-19
PRIOR APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NO 9
LENGTH: 594 ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-377-155-9 Query Match 100.0%; Score 3019; DB 4; Best Local Similarity 100.0%; Pred. No. 1.5e-226; Matches 594; Conservative 0; Mismatches 0; 1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE 1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE Length Indels 0,

Gaps

0;

60

```
QУ
                                             밁
                                                                     δÃ
                                                                                                        망
                                                                                                                                   Qy
                                                                                                                                                                    В
                                                                                                                                                                                          Qy
                                                                                                                                                                                                                               ф
                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                        Вр
                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEO ID NOS: 33
SOFTWARE: PATENTIN VET: 2.0
                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 594; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 9, Application US/09669974 Patent No. 6333173 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQ ID NO 9
LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM: N
-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: PRT
                 301
                                                                                                          181
                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                               241
                                                                          241
                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                 121
                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                       \vdash
                                         MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE 60
               SSTDKGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETYTSGTNVTFASGKGTTA
                                                                                                                      LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNV
                                                                                                                                                                                  NTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVH 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                           PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNV
                                                                                                                                                                   NTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVH
                                                                                                                                                                                                                             PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                    100.0%; ilarity 100.0%; Conservative
                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                 Score 3019; DB 4;
Pred. No. 1.5e-226;
); Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                             Length 594;
                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                        300
                                                                                                      240
                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                                                                                    0
```

```
SEQ ID NO 7
LENGTH: 594
TYPE: PRT
ORGANISM: Neisseria meningitidis
US-09-377-155-7
                           δÃ
                                                                Дb
                                                                                           Qy
                                                                                                                                                        οy
                                                                                                                                                                                         Db
                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 3
US-09-377-155-7
; Sequence 7, Application
; Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
   밁
                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
Matches 568; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE:
   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                               301
                                                                241
                                                                                               241
                                                                                                                              181
                                                                                                                                                          181
                                                                                                                                                                                           121
                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                 DEVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKGEND 300
                                                                                                                                           LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNV 240
PVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTNE 120
                                                                                                                                                                                                                                                                        PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE 420
                                                                                                                                                                                                        NTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVH 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                DFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKDENG 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVRITNVAPGVKEGDYTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                              LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNV
                                                                                                                                                                                           NTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                              95.2%;
95.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/09377155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2.0
                                                                                                                                                                                                                                                                                                                                                                                 5;
                                                                                                                                                                                                                                                                                                                                                                               Score 2874; DB 4;
Pred. No. 2.8e-215;
5; Mismatches 21;
                                                                                                                                                                                                                                                                                                                                                                                                             Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          594
                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        540
                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         540
                                                                                                                                                                                                                                                                                                                                                                                 0
```

QΥ

361

TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE

```
Qy
                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                        2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                          Qy
                                                                                                                                   δÃ
                                                                                                                                                                       맑
                                                                                                                                                                                               ρ
                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                   Q
                                                  밁
                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                : ORGANISM: Neisseria meningitidis US-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
APPLICANT: PERK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 055064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match 95.2
Best Local Similarity 95.6
Matches 568; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 7, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQ ID NO 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: PRT
                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                  301
                                                                                301
                                                                                                              241
                                                                                                                                         241
                                                                                                                                                                       181
                                                                                                                                                                                                    181
                    361
                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                      MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                  NTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVH 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                               LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNV
                                                                                                                                                                                                                                                                                                           PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVRITINVAPGYKEGDYTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPG
                                                                                                           DFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKDENG
                                                                                                                           DFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKGEND
                                                                                                                                                                       LNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNV
                                                                                                                                                                                                                                NTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDPTVH
                                                                                                                                                                                                                                                                                             PVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTNE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                                                  95.2%;
95.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                   5
                                                                                                                                                                                                                                                                                                                                                                                                                Score 2874; DB 4;
Pred. No. 2.8e-215;
5; Mismatches 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480
                                                                             360
                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                    420
                                                  360
                                                                                                                                         300
                                                                                                                                                                       240
                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540
                                                                                                                                                                                                                                                                                                                                                                                                                   0;
```

```
밁
                                             δÃ
                                                                          멍
                                                                                              Qy
                                                                                                                            Ъ
                                                                                                                                                  Qy
                                                                                                                                                                             망
                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; ORGANISM: Neisseria meningitidis US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
APPLICANT: PEAK, I an Richard Anse
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE
                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 566; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER OF SEQ ID NOS:
SOFTWARE: PatentIn Ve
SEQ ID NO 13
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 13, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 199-08-19
PRIOR APPLICATION NUMBER: PCT/AN98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION NUMBER: GB PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FILE REFERENCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                      177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
 417
                         361
                                                                          301
                                                                                                    297
                                                                                                                             241
                                                                                                                                                                              181
                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                   MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PVQRTAVYLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                                                                                            SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                              PTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                          TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                NTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGD
                                                                                                                                                                                                                                            NTNA----SSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD
                                                                                                                                                                                                                                                                                 PVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTNE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                94.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GB 9726398.2
                                                                                                                                                                                                                                                                                                                                                                                    Score 2855; DB 4;
Pred. No. 8.5e-214;
6; Mismatches 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Anselm
                                                                                                                                                                                                                                                                                                                                                                                                             Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               594
                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                      296
                                                                                                     356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                          420
                                                 416
                                                                            360
                                                                                                                             300
                                                                                                                                                                                                      236
                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         540
                                                                                                                                                                              240
                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                        ۳.
```

Q

```
δÃ
                                             맑
                                                                    Qy
                                                                                                     밁
                                                                                                                                Qy
                                                                                                                                                               В
                                                                                                                                                                                          Q
                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                             QY
                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; ORGANISM: Neisseria meningitidis US-09-669-974-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-669-974-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 13, Applica Patent No. 6333173 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION NUMBER: PCT/AU98/01031 PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH: 598
                 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                       301
                                                                                                                                     297
                                                                                                                                                                 241
                                                                                                                                                                                                237
                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                          177
                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA 536
               KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                           GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSFSKG 416
                                                                                                                     GENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK 356
                                                                                                                                                              TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 236
                                                                                                                                                                                                                                                                                   NTNA----SSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD 176
                                                                                                                                                                                                                                                                                                                                               DENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGN
                                                                                                                                                                                                                           PTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLAQA 540
                                          GTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
h 94.6%;
Similarity 94.6%;
66; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Application US/09669974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 2855; DB 4;
Pred. No. 8.5e-214;
6; Mismatches 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            598
                                                                                                     360
                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1;
```

```
δð.
                                                     20
                                                                                  DЬ
                                                                                                            Qy
                                                                                                                                                                 Ş
                                                                                                                                                                                                   밁
                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 5
LENGTH: 598
TYPE: PRT
ORGANISM: Neisseria meningitidis
US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-377-155-5; Sequence 5, A)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                             밁
                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; Sequence 5, Application ; Patent No. 6197312 ; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: PEAK, IAN APPLICANT: JENNINGS, APPLICANT: MOXON, E. TITLE OF INVENTION: FILE REFERENCE: 0650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 566; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRIOK AFFECTING DATE: 1997-
PRIOR FILING DATE: 1997-
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
  477
                             421
                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                       177
                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              481
                                                                                    361
                                                                                                              357
                                                                                                                                           301
                                                                                                                                                                       297
                                                                                                                                                                                                   241
                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421 KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 480
                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                               GENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK 356
                                                                                                                                                                                                                                                           PTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                          TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA
                                                                                                 GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                           GENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGN
                                                                                                                                                                                                                  SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK
                                         KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 476
                                                                                  GTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                 SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGK
                                                                                                                                                                                                                                                                                                                   NTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGD
                                                                                                                                                                                                                                                                                                                                 NTNA----SSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PEAK, Ian Richard A
JENNINGS, Michael P
MOXON, E. Richard
INVENTION: NOVEL SURF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   94.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US/09377155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      score 2852; DB 4;
pred. No. 1.5e-213;
5; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Anselm
Paul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                               296
                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                  420
                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                  60
```

1;

```
Ş
                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                     Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-
                                          밁
                                                                    δÃ
                                                                                                밁
                                                                                                                      δÃ
                                                                                                                                                    В
                                                                                                                                                                             QY
                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
              õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-669-974-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 5, Application US/09669974 Patent No. 6333173 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQ ID NO 5
LENGTH: 598
TYPE: PRT
ORGANISM: Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRIOR APPLICATION NUMBER: US 09/377, 155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQ ID NOS: 33
                477
                                           421
                                                                                                 361
                                                                                                                           357
                                                                                                                                                       301
                                                                                                                                                                                   297
                                                                                                                                                                                                               241
                                                                                                                                                                                                                                         237
                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                               177
                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NTNA----SSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD
                                                                                                                                                                                                                                                                                                                                                                                            PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGYYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK 296
                                                                                                                                                                                                                                                                                TTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                        NTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGD 180
                                                                                                                                                                                                                                                                                                                                                                               PVQRTAVVLSFRSDKEGTGEKEGTEDSNWAVYFDEKRVLKAGAITLKAGDNLKIKQNTNE
DANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNHIDNYDGNARAGIAQAIATAGLYQA
                                                       KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 476
                                                                                                                                                                                                            SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGK
                                                                                                                                                                                                                                                                   PTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                          KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             566;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          94.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 2852; DB 4;
Pred. No. 1.5e-213;
5; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                             236
                                                                                                                          416
                                        480
                                                                                                                                                                                                                                                                  240
                                                                                                420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ۲.
```

```
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12.
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN Ver. 2.0
SEQ ID NO 15
LENGTH: 599
Š
                          밁
                                                       δÃ
                                                                                      밁
                                                                                                                 Q
                                                                                                                                                Вb
                                                                                                                                                                          Q
                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                뮍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Neisseria meningitidis US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 15, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: PEAK, Ian Richard Anse APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE FILE REPERSONNEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: PRT
 536
                             481
                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                           176
                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                               356
                                                                                                                                                                                                          301
                                                                                                                                                                                                                                        296
                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                     117
                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS
                                                                                                                                                                                                                                                                                                                                             DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                 EPVVRSALVLQFMIDKEGNGENESTGNIGWSIYYDNHNTLHGATVTLKAGDNLKIKQNTN
 AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                             KDANKPYRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ
                                              KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQ
                                                                                                                                              KGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 415
                                                                                                                                                                                                       KGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASG
                                                                                                                                                                                                                                                                  ASDNVDFYRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLYTGKD
                                                                                                                                                                                                                                                                                                                             DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                      KNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                    -NTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLAQA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tch 91.5%; Score 2762.5; al Similarity 91.7%; Pred. No. 1.36 549; Conservative 13; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .5; DB 4;
1.3e-206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <u>5</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                           235
                             540
                                                                                         480
                                                                                                                    475
                                                                                                                                                                                                            360
                                                                                                                                                                                                                                      355
                                                                                                                                                                                                                                                                     30C
                                                                                                                                                                                                                                                                                                 295
                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
```

DЬ

541 AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW

599

```
δõ
                                                                                                           В
                                                                                                                                       δÃ
                                                                                                                                                                          Вþ
                                                                                                                                                                                                     δδ
                                                                                                                                                                                                                                        ΡЪ
                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-669-974-15

: Sequence 15, Application US/09669974

: Patent No. 6333173
              Ş
                                               밁
                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; TYPE: PRT; ORGANISM: Neisseria US-09-669-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 549; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE: P
SEQ ID NO 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: PEAK, APPLICANT: JENN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LENGTH: 599
                 536
                                                                                                             421
                                                                                                                                          416
                                                                                                                                                                                                          356
                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                   236
                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                          361
                                                                                                                                                                                                                                                                        296
                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                            117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL 59
                                                                                                                             GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS
                                                                                                                                                                                                                                                                                                   DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT 235
AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                               KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQ 535
                                                                                                           GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDKGALNVGS
                                                                                                                                                                                                                                                                                                                                                                                                                             KGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 420
                                                                                                                                                                                          KGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 415
                                                                                                                                                                                                                                      KGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASG
                                                                                                                                                                                                                                                      KGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EPVVRSALVLQFMIDKEGNGENESTGNIGWSIYYDNHNTLHGATVTLKAGDNLKIKQNTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ--- 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
                                               KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   91.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; Score 2762.5; DB 4
; Pred. No. 1.3e-206;
13; Mismatches 32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                               540
                                                                                                           480
                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                     355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2
```

```
δÃ
                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                            Ω
                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; TYPE: PRT; ORGANISM: Neisseria US-09-377-155-21
                      Ωy
                                                           Дb
                                                                                     Q
                                                                                                                      망
                                                                                                                                                                                     밁
                                                                                                                                                                                                              ğ
                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 11
US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: Particle SEQ ID NO 21
LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 21, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION NUMBER: PCT.
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: FILE REFERENCE: 06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                      417
                                                                                                                       415
                                                                                                                                                                                     355
                                                                                                                                                                                                                   357
                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                               297
                                                                                                                                                                                                                                                                                                              235
                                                                                                                                                                                                                                                                                                                                                                           175
                                                                                                                                                                                                                                                                                                                                                                                                        177
                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    117
                                                                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Sin
hes 552;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541 AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLEATVQASTTD---DDDL 57
|||||||||||||| : ::||
1 MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL 60
                                                                                                                                                                                                                                                                                                                                                                        TTVHLNGIGSTLIDTLLNTGATINVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 236
                                                                                                                                                                                                                                                                                                                                                                                                                                      DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA 536
                                                                                                                                       KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 476
                                                                                                                                                                                   GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                 GENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGOTGQADKFETVTSGTNVTFASGK 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ 116
YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
              YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                  GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG 416
                                                                                                                                                                                                                                                                                                                           SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120
                                                          KDNKPYRITNVAPGYKEGDYTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                       KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK 473
                                                                                                                                                                                                                                                                                                              SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PEAK, Ian Richard
JENNINGS, Michael
MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NOVEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ω
ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           91.4%;
92.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PCT/AU98/01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GB 9726398.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Paul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2758.5; DB 4
Pred. No. 2.6e-206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 599
                                                             533
                                                                                                                                                                                                                                                  354
                                                                                                                                                                                     414
                                                                                                                                                                                                                                                                                                            294
                                                                                                                                                                                                                                                                                                                                             296
```

4.

```
δÃ
                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                   80
                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                QΥ
                                                                         В
                                                                                                        δÃ
                                                                                                                                       밁
                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Neisseria meningitidis US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 12
US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: Pate
SEQ ID NO 21
LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 91.4%; Score 2758.5; Best Local Similarity 92.3%; Pred. No. 2.6c Matches 552; Conservative 14; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 21, Application Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: PEAK, Ian Richard Anselm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: PRT
                                                                         474
                                                                                                              477
                                                                                                                                               415
                                                                                                                                                                                    417
                                                                                                                                                                                                                          355
                                                                                                                                                                                                                                                               357
                                                                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                                                                                     297
                                                                                                                                                                                                                                                                                                                                                                          235
                                                                                                                                                                                                                                                                                                                                                                                                           237
                                                                                                                                                                                                                                                                                                                                                                                                                                                   175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD----DDDL
||||||||||||| : ::||
MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                     YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                         DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQA 536
                                                                                                                                           KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 476
                                                                                                                                                                                                                                                                                                                GENDSSTDKGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                                           SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NTNENTNASSETYSLKKDLTDLTSVGTEKLSESANSNKVNITSDTKGLNEAKKTAETNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ
YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                     KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                                                                                                              GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK
                                                                                                                                                                                                                                                                                                                                                                        SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                 TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US/09669974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .6e-206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11;
```

354

294

236 174

234

416

RESULT

US-09-669-974-2 ; Sequence 2, Application US/09669974 ; Patent No. 6333173

592

533

414

354

295

294

235 174

234

```
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 2
LENGTH: 592
TYPE: PRT
ORGANISM: Neisseria meningitidis
US-09-377-155-2
                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                      Дb
                                                                                ΩV
                                                                                                                                       Qy
                                                                                                                                                                         밁
                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                        ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Б
                                                                                                               밁
                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
Matches 551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
APPLICANT: PEAK, I AN RICHART ANSelm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE AL
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 2, Application US/09377155 Patent No. 6197312
534
                           536
                                                      474
                                                                                                                415
                                                                                                                                            416
                                                                                                                                                                          355
                                                                                                                                                                                                    356
                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                             296
                                                                                                                                                                                                                                                                                           235
                                                                                                                                                                                                                                                                                                                        236
                                                                                                                                                                                                                                                                                                                                                     175
                                                                                                                                                                                                                                                                                                                                                                                 176
                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                           116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
mes 551; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS
          AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                     DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                         ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKD
                                                                                                                                                                                                                                                                                                                                                                                                              Q-----NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNG
                                                                                                                                                                                                                                                                                                                                                                                                                            QNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LYLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIK 115
AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                           ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGVKTSVIKEKDGKLVTGKD
                                                                                                                                                                                                                                                                                                                                                    DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    91.1%; Score 2751; DB 4; 92.0%; Pred. No. 1e-205;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12;
```

120

60

Gaps

4.

Gaps

4;

60

```
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT APPLICATION NUMBER: US 09/377,155
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
                              δÃ
                                                                        В
                                                                                                     Qy
                                                                                                                                               DЬ
                                                                                                                                                                            Qy
                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
 밁
                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOFTWARE: PatentIn Ver. 2.0 SEQ ID NO 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH: 592
                                      536
                                                                        474
                                                                                                              476
                                                                                                                                                                                                                                                                                                                                                                                                                                                175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                176
                                                                                                                                                                                   416
                                                                                                                                                                                                                                                                                                                                                                         235
                                                                                                                                                                                                                                                                                                                                                                                                           236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         116
                                                                                                                                                                                                                        355
                                                                                                                                                                                                                                                            356
                                                                                                                                                                                                                                                                                                295
                                                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDD----DD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNG 175
                   AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                               DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT 235
                                                                                                                                                                                                                    KGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK 415
                                                                                                                                                                                                                                                                                            KGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASG 355
                                                                                                                                                                                                                                                                                                                                                                     ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLYTGKD
AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                      KKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ
                                                                                         KDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQ
                                                                                                                                             GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGS
                                                                                                                                                                GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGS 475
                                                                                                                                                                                                                                                                                                                                                                                                                                              DTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LYLEPYQRTAYVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIK 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MNKIYRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNERPRKKD 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           91.1%; Score 2751; I
92.0%; Pred. No. 1e-:
tive 13; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1; DB 4;
1e-205;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12;
```

```
RESULT 15
US-09-377-155-11
; Sequence 11, Application US/09377155
; Patent NO. 6197312
; GENERAL INFORMATION:
```

```
밁
                                                                                                  ρ
                                                                                                                                       Db
                                                                                                                                                                        Qγ
                                                                                                                                                                                                            B
                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 90.7
Best Local Similarity 91.8
Matches 549; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOFTWARE:
SEQ ID NO 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE OF INVENTION: FILE REFERENCE: 06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH: 591
                                                                     474
                                                                                                        477
                                                                                                                                                                          417
                                                                                                                                                                                                            355
                                                                                                                                                                                                                                             357
                                                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                                                                   297
                                                                                                                                                                                                                                                                                                                                                       235
                                                                                                                                                                                                                                                                                                                                                                                       237
                                                                                                                                                                                                                                                                                                                                                                                                                                                              177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        سم
                  YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                     DANKPYRITNYAPGYKEGDYTNYAQLKGVAQNLNNHIDNYDGNARAGIAQAIATAGLVQA 536
                                                                                                                                                                                                                                                                              SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK 296
                                                                                                                                                                                                                                                                                                                                                                                                                        TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLFAGTITLKAGDNLKIKQ 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNEILRIIWNSALNAWVVVSELTRNHTKRASATVKTAVLATLLFATVQASANNEEQEEDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD---DDDL
                                                                                                                                       KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK 473
                                                                                                                                                      KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 476
                                                                                                                                                                                                                             GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ~~~~~NGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGD
                                                                     KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQA
                                                                                                                                                                                                            GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YLDPVLRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ
YLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PEAK, Ian Richard Anse
JENNINGS, Michael Paul
MOXON, E. Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NOVEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ω
3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            90.7%; Score 2739.5; DB 4; 91.8%; Pred. No. 7.9e-205; tive 15; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                591;
```

120

60 57 Gaps

4

Gaps

4;

Search completed: Job time: 529 sec July ω

592 594 533

473

533

414 416 294

THIS PAGE BLANK (USPTO)

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Total number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein -
     Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
DB
  2533
384.5
388.5
368.5
368.5
368.5
3168.5
3244
239
224
222
220
219
2113
211.5
211.5
211.5
211.5
212.5
214.5
214.5
214.5
214.5
214.5
214.5
214.5
214.5
214.5
214.5
214.5
214.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-771-382-4
3019
1 MNKIYRIIWNSALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4 3 : :
4 : :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query
     July 3, 2002, 08:12:12; Search time 95.27 Seconds (without alignments) 599.108 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIR_71:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             283138 segs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           pir1:*
pir2:*
pir3:*
pir4:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MNKIYRIIWNSALNAWVAVS.....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2000000000
  298
2059
1190
1588
1588
1658
1004
11004
11004
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11005
11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               96089334 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gapext 0.5
M86036
H91160
G64964
G64964
G84964
G861477
A41872
A41873
H83135
A64905
A64900
D96803
B41855
B41855
B41855
B41855
B41853
B4185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 G81133
A81888
I64138
D82671
A82615
AC0976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ¥S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             283138
                                                                                                                                                                     probable adhesin Phish-molecular wei adhesin AIDA-I pre hypothetical prote ydek protein - Esc hypothetical prote hida-I adhesin lik probable adhesin lik probable autotrans high-molecular wei adhesin bigh-molecular wei
                    probable beta-barr
sapB protein - Cam
                                                                            hypothetical prote
AidA-I adhesin-lik
                                                                                                                                                                                                                                                                                                                                                                                                                              surface-exposed ou
190K surface antig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  probable adhesin E
probable adhesin E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   adhesin homolog surface protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            adhesin NMB0992 [i
                                                                                                                                                        probable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                hypothetical prote
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             probable surface p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    probable autotrans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface protein XF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       probable surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Description
                                                                                                                           probable
                                                                                                                           adhesin h
  A precui
```

A; Experimental source: C; Genetics: A; Gene: NMB0992

A;Status: preliminary A;Molecule type: DNA A;Residues: 1-591 <TET>

A;Cross-references:

GB:AE002450; ce: serogroup

GB:AE002098; NID:g7226229; PIDN:AAF41395.1; PID:g722 B, strain MC58

45	44	43	42	41	40	39	38	37	36	35	34	ω	32	31	30
194	194	194.5	195	195	197	197	198	200	200	200	200.5	201.5	203	203	203.5
6.4	6.4	6.4	6.5	6.5	6.5	6.5	6. 6	6. 6	6. 6	6.6	6.6	6.7	6.7	6.7	6.7
2468	920	4152	1417	1029	3029	2551	2020	3013	980	980	1343	1109	4936	1608	1343
N	N	N	N	N	N	Ν	N	N	2	N	ν	2	N	N	N
A83412	140614	T31102	A83080	T30852	S76109	B98047	C48399	AB0480	D85532	н90681	E90893	A56143	AH2515	A28182	D85724
hypothetical prote	surface array prot	filamentous hemagg	hypothetical prote	outer membrane pro	hypothetical prote	hypothetical prote	ABC-type transport	probable invasin Y	probable structura	probable flagellin	hypothetical prote	surface-array prot	hypothetical prote	hemolysin A - Serr	hypothetical prote

## ALIGNMENTS

RESULT G81133

δõ В Qy 밁 Q Вb QΥ Вþ δÃ 밁 ş Š 밁 Best Local Similarity Matches 552; Conserv Query Match Best Local ( 357 295 297 235 237 175 177 121 117 61 YLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ 120 58 NTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGD 176 TTVHLNGIGSTLIDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 236 YLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQ 116 GTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG GENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK 356 SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDK 296 GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGK SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDK Conservative 91.4%; Score 2758.5; DB 2; 92.3%; Pred. No. 1.5e-131; 14; Mismatches Indels Length 591; Gaps 416 294 4:

```
probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis (strain C;Species: Neisseria meningitidis C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001 C;Accession: A81888 R;Parkhill, J; Achtman, M.; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, S.R.; M.; Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quail, M.A.; Rajandr Nature 404, 502-506, 2000 A;Ritle: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis Z249 A;Reference number: A81775; MUID:20222556
                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Experimental source: serogroup C; Genetics: A; Gene: NMA1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
В
                                    Qy
                                                                          뮹
                                                                                                                                                   Ъ
                                                                                                                                                                                 Qy
                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 1-592 < PAR>
A; Cross-references: GB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cross-references: GB:AL162755; GB:AL157959; NID:g7379742; PIDN:CAB84461.1; Experimental source: serogroup A, strain Z2491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          477
                                                                                                              353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      474
                                                                            351
                                                                                                                                                     291
                                                                                                                                                                                         293
                                                                                                                                                                                                                             231
                                                                                                                                                                                                                                                                                                                                                                         113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  537
                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTD-DDDLYL
                                                                                           ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DANKPYRITNYAPGYKEGDYTNYAQLKGVAQNLNNHIDNYDGNARAGIAQAIATAGLYQA 536
                      PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                                                                                                   GKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                      GKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                           TTGQSENVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                         TA--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                   GDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                       KONTNENTNASSETYSIKKDLTGLINVETEKLSEGANGKKVNIISDTKGLNFAKETAGTN
                                                                                                                                                                                                                                                                                                                                                                                        KQNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETN 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EPVQRTAVVLSFRSDKEGTGEKE-----VTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PSKGKMDETVNINAGNNIEISRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDEGALN
                                                                          ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                  GDTTVHLNGIGSTLTDTLAGSSASHVDAGNQST--HYTRAASIKDVLNAGWNIKGVKTGS
                                                                                                                                                                                                                                                                                                                                                                                                                                              ESVQR-SVVGSIQASMEGSGELETISLSMTNDS-----KEFVDPYIVVTLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVKTAVLATLLFATVQANATDEDEEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              83.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2533; DB 2;
Pred. No. 3.2e-120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A strain of Neisseria menigitidis Z2491.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                          410
                                                                                                            412
                                                                                                                                                                                                                                                                                                                                    234
                                                                                                                                                                                                                                                                                                                                                                         172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   414
                                                                                                                                                   350
                                                                                                                                                                                       352
                                                                                                                                                                                                                         290
                                                                                                                                                                                                                                                            292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S.R.; Morel
Rajandream,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PID: g73798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   224
```

surface protein XF1529 [imported] - Xyl C; Species: Xylella fastidiosa C; Date: 18-Aug-2000 #sequence\_revision C; Accession: D82671 R; anonymous, The Xylella fastidiosa Con Nature 406, 151-157, 2000

Consortium of

the Organization for Nucleotide

Xylella fastidiosa

20-Aug-2000

#text\_change 20-Aug-2000

Xylella fastidiosa (strain

A; Title: The genome sequence of the plant pathogen A; Reference number: A82515; MUID: 20365717 A; Note: for a complete list of authors see reference

reference

below

```
R;Fleischmann, R.D.; Adams; M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage; Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weidman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M.; Science 269, 496-512, 1995
A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Vente A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd. A;Reference number: A64000; MUID:95350630
A;Accession: I64138
A;Status: nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: DNA
A; Residues: 1-298 <TIGR>
A; Cross-references: GB:U32846;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    adhesin homolog HI1732 - Haemophilus influenzae (strain Rd KW20)
C;Species: Haemophilus influenzae
C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 24-Oct-1997
C;Accession: I64138
B
                           Ş
                                                              В
                                                                                          δÃ
                                                                                                                             В
                                                                                                                                                            δÃ
                                                                                                                                                                                             В
                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             471
275 GKQLKDANTGT 285
                               293
                                                              215
                                                                                               233
                                                                                                                                156
                                                                                                                                                                                               100
                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            473
                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                  ы
                                                                                                                                                                                                                                                                                                                                                  å
                                                                                                                                                  TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKDKGENDSST
                                                                                 WQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAG
                                                                AGGNTENVDLVAGYDNVEFITGDKNTLDVVLTAKENGKTTEVKFTPKTSVIKDNNGKLLT
                                                                                                                                                                                               -DQGGKSVTFALAKDLDVKTAKVSDTLTIGGNTPAAGGATPKVSITSTADGLKLAK---G
                                                                                                                                                                                                                               ENTNASSFTYSLKKDLTDLTSVGTEKLSFSAN-----SNKVNITSDTKGLNFAKKTAE 172
                                                                                                                                                                                                                                                                 - INDAGTFVKVQSTEDDIEDSAATKDDN-----KNQALKAGDTLTLKAGKNLKAKL---
                                                                                                                                                                                                                                                                                               PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAG-TITLKAGDNLKIKQNTN 119
                                                                                                                                                                                                                                                                                                                                  MNKIFKVIWNVVTQTWVVVSELTRAHTKRTSATVATAVLATVLSATVQA------
                                                                                                                                                                                                                                                                                                                                                                                                    145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          594
                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                  20.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GB:L42023; NID:g1574588; PID:g1574589;
                                                                                                                                                                                                                                                                                                                                                                                                    41;
                                                                                                                                                                                                                                                                                                                                                                                                 Score 620; DB 2
Pred. No. 2e-24;
1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                  ?
                                                                                                                                                                                                                                                                                                                                                                                                    91;
                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TIGR: HI1732
                                                                                               292
                                                                                                                                214
                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             530
                                                                                                                                                                                                                                                                 99
                                                                                                                                                                                                                                                                                                                                                                                                  7;
```

```
A; Experimental source: strain 9a5c
R; Simpson, A.J.G.; Relnach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; ABRIONES, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H. Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H. Bar-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.; submitted to GenBank, June 2000
A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frohm J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigrachado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, F.A.; Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.A.; Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A; Authors: da Silva, A.G.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silveira, M.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; A, Reference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Accession: D82671
A; Status: preliminary
A; Molecule type: DNA
A; Residues: 1-2059 <S:
                                                                                                                    Ş
                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                            뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Contents: annotation C; Genetics:
Š
                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Residues: 1-2059 <SIM>
A;Cross-references: GB:AE003982; GB:AE003849; NID:g9106554; PIDN:AAF84338.1; GSPDB:GN00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1451
                                                                                                                                                                                                                                                                                                          1849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1397 VTAGTEETDAVNFSQLKSISTAVDQGWTLTASGANGSKVAS----GGTVDLKN--TDGNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105 TL-KAGDNLKIKONTNENTNASSFTY---SLKKDLTDLTS---VGTEKLSFSANSNKVNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          47 VQASTTDDDDLYLEPVQ--RTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTI 104
GKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                          DAVAQKSNLQTDDMRHEINNIEDVFKITKGDSASSVKG
                                                                                                                                                                                                                                                                                                                                                                                                                         GDGAKDGGRGAESYTGKYSGVQNNTVGTVSVGDAAKGETRSISNVADAKEAMDAVNLRQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAGVG-----TQASGEGAAA-----VGSG---AAASGKGSTAIGRNAIASADGSVAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DKVISHVAVGMADTDAVNVSQLKQAVQSVTVKATRYYSTNDGGTQGGNYDGDGATGSKAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SNDVVFNLSKDFKVDEVTAGNTVVNTDGVKVG--SDVSLGAMGLFIANGPSVTASGFNAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYDTVEFLSADTK-----TTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TEDTDAVNFSQLK---SVSEAVDKGWTLTASGANGSKVVSGGTVDLKNTDGNLAISKSGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---NDNVTDDEKKRAASVKDVLNAGWNI-----KGVKPGTTASDNVD-----FVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TISKSGDSNDVVFNLSEDLKEKSITVGNTQLDKDGVKVSSNVLLDSNELVITSHSSTSSV 1510
                                                        VTNVAAGTADTDAVNVSQLNQGLITAKQYTDGMVGNLRRETSGGVAAAIATANLPQAYVQ
                                                                                                                    ITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNAR----AGIAQAIATAGLVQAYLP
                                                                                                                                                                                   NAAVSGTESVALGKNTNVSAD-----NAVAIGNGSVA-----DRANSVSVGSGGSER--Q
                                                                                                                                                                                                                                        NIEITRN-----GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KTLANGESVVNRTV-VNGDGVNIDDVVVVNDLGLSIVGGASLTLSGINAGSHKITNVTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TSDTKGLNFAKKTAETNG-----DTTVHLNGI-----GSTLTDTLLNTGA--TTNVT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13.2%; score 398.5; DB 2; 24.5%; Pred. No. 3.2e-12; tive 100; Mismatches 221;
                                                                                                                                                                                                                                                                                                                                                                ----KAVAGSSGKVISGNVSPSKGKMDETVNINA---GN 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---TVS-----KDDQGNITVMYDVNVG-DALNVNQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -NDSSTD----KGEGLVTAKEV 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 2059;
                                                                                                                                                                                                                                                                                                    --MGVNAMAIGT 1896
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         219;
                                                                                                                                                                                   1944
                                                                                                                                                                                                                                                                                                                                                                                                                            1848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         33
```

```
Db 2005 GRGMTSVGVSSYQGQSAIAVGVSAVSESGHWVFKFSGSANTRSHVGVGAGVGYQW 2059
```

```
A;Residues: 1-1190 <SIM>
A;Residues: 1-1190 <SIM>
A;Cross-references: GB.AE004017; GB:AE003849; NID:g9107083; PIDN:AAF84783.1; GSPDB:GN
A;Experimental source: strain 9a5c
R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.
Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer
as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr
J.D.; Junqueira, M.L.; Kemper, E.L.; Kttajima, J.P.; Krieger, J.E.; Kuramae, E.E.; La
chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins
A;Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menok, C.F.M.; Miracca, E.C.; Miyaki, C.
, F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri,
Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sava
A;Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva
M.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.
A.Cortente: archito.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C;Accession: A82615
R;anonymous, The Xylella fastidiosa Consortium of the Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       surface protein XF1981 [imported] - Xylella fastidiosa (strain 9a5c)
C;Species: Xylella fastidiosa
C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
δÃ
                                                                  B
                                                                                                                                  δõ
                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Accession: A82615
A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Title: The genome sequence of the plant pathogen Xylella fastidiosa. A;Reference number: A82515; MUID:20365717
A;Note: for a complete list of authors see reference number A59328 below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  682 VTSSGISAGNQKITNVAAGTADTDAVNFSQLQAVSSTASKGWNLLASGANSSNVAPGESV
                                                                                                                                                                                                                                                                           297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              51 TTDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEVTED-----SNWGVYFDKKG-VLTAGTI 104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ģ
                                                                                                                                                                                                                                                                                                                                           YYSTYD-----GGTQGGNYNGDGATGTRSIAVGVGTLASAEGATAVGSGAAASGKGSTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NVTNDNVTDDEKKRAASVKDVLNAG-WNIKGVKPGTTASD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TLKAG----DNLKIKQNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TTDSNDVTFN-----LATALKVDSLTTGNTAMTTDGVTVGSN--VTLGSTGLVITDGPS 681
                                                                                                                                                                                                        IGRNAVASADGSVALGDGA-------KDGAR----GAESYTGKYSGLQNNTVGTVS
                                                                                                                                                                                                                                                                           -GEN----DSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                          FVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTS---VIKEKDGKLVTGKDK--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DLKNTDGNIVISKESGSNDVLFNLSSSLKLDKLTVGDTVMTTNGV-----TVGSGVTL 794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----ITSDTKGLN-----FAKKTAETNGDTTVHLNGIGSTLTDTLLNTGATT 199
   ISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSMGLVITDGPSVTSSGI----NAGSQKITNVAAGTADTDAVNLSQLNTAMAGSGAKSVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12.7%; Score 384.5; DB 2; 25.2%; Pred. No. 8e-12;
                                                                      -NVADAKEAT--DAVNLRQLDRVAQDANRYVDNKIESLSEGQT 1002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 231;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Organization for Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels 165;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ---NVD 241
                                                                                                                                                                                                               949
                                                                                                                                                                                                                                                                                                                                              904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Seq
```

Qy 333 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQG 368	622 SIALGSGSTSNRAITTGIRETSATSDGVVIGYNTTDRELLGALSLGTDGESYRQITNVAD	Db 569 GTGVKYIRTUDUGLEGQDAYATGUGATAVGYDAVASGAGCLALGQUSSSSIEG 621	D	Qy 218 KDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVN 262	452 AGALSEDSTDAVNGSQLYETNQKVDQNTSAIADINT-SITNLGTDALSWDDEEGAFSA	Qy 119NENTNASSFTYSLKKDLTDLTSVGTEKL-SFSANSNKVNITSDT 161	QY 81 KEVTEDSNWGVYFDKKGVLTAGTIT-LKAGDNLKIKQNT 118 :::	OY 27 TKRASATVATAVLATLLFATVQASTTDDDDLYLEPVQRTAVVLSFRSDKEGTGE 80	Ouery Match 12.4%; Score 375.5; DB 2; Length 1107; Best Local Similarity 21.7%; Pred. No. 2.1e-11; Matches 185; Conservative 105; Mismatches 262; Indels 299; Gaps 33;	A; ACCESSION: ACCESSIO	Nature 413, 848-852, 2001 A;Authors: Parry, C.; Quail, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; A;Title: Complete genome sequence of a multiple drug resistant Salmonella enterica serov A;Reference number: AB0502; PMID:11677608	probable autotransporter sapB [imported] - Salmonella enterica subsp. enterica serovar Typhi C;Species: Salmonella enterica subsp. enterica serovar Typhi A;Note: this species has also been called Salmonella typhi C;Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change 09-Nov-2001 C;Accession: AC0976 C;Accession: AC0976 C;Frankhill, J.; Dougan, G.; James, K.D.; Thomson, N.R.; Pickard, D.; Wain, J.; Churcher, th, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N.; Farrar, S.; Moule, S.; O'Goara, P.	RESULT 6	Qy 560 GYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594	Qy 504 GVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAI 559 :	OY 461PTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLK 503	Db 1003 FVKVNSLNNSATPIAAGVDATAIGVGATASGADSI 1037
	Qy 151 I	ф 971 л			Qy 7:	Query Mat Best Loca Matches	A;Experimen C;Genetics: A;Gene: Z5(	A;Status: p A;Molecule A;Residues: A;Cross-rei	iller, L.; Nature 409, Nature 409, A;Title: Ge A;Reference A;Accession	RESULT 7 A86036 probable ac C;Species: C;Date: 16 C;Accessior R:Perna. N	Qy 584 I Db 1097 I	Qy 504  Db 977 ( Qy 524 ( Db 1037 (	Db 919				0v 369

Oy 369NITWATDANDALDANN							o :	Ĥ Ĥ						
: a <sub>t</sub> y 3	971 LDDNALLWDETANGGAGAYNASHDGKASIITNVANGSISEDSTDAVNGSQLNATNMMLEQ 151 NSNKVNITSDTKGLNFAKKTAETNGDTTVHLNGI  : :	880 LLWDADAGENGAFSAAHGKDKTASVITNV-ANGAISAASSDAINGSQLX 61 PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKI :	Query Match  12.2%; Score 368.5; DB 2; Length 1588;  Best Local Similarity 23.0%; Pred. No. 7.4e-11;  Matches 174; Conservative 94; Mismatches 274; Indels 213; Gaps 3  7 IIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE 60  ::	Accession: A86036 Status: preliminary Molecule type: DNA Molecule type: DNA Residues: 1-1588 <sto> Cross-references: GB:AE005174; NID:g12518349; PIDN:AAG58749.1; GSPDB:GN00145 Experimental source: strain 0157:H7, substrain EDL933 Genetics: Gene: Z5029</sto>	adhesin Z5029 [imported] - Escherichia coli (strain O157:H7, substrain EDL9: Escherichia coli 0.Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001 0.n: A86036 N.T.; Plunkett III, G.; Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; Ma; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis, K.; Apod 19, 529-533, 2001 Genome sequence of enterohemorrhagic Escherichia coli O157:H7.  Genumber: A85480; MUID:21074935; PMID:11206551	RESULT 7 A86036	Qy 584 FGASASVGYQW; ;  :  :   Db 1097 YSAAIGAGFQW	QY 524 IAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGH	504NLNNHIDNVDGNARAG	469 -GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLK	440DIATSMTPQFSSVSLGAGADAPTLSVDDE	398 AVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNI	742 IGLNTLVMADAINGIAIGSNARANHANSIAMGNGSQTTRGAQTDYTAYNMDTPQNSVGEF	369 NITYMYDVNVGDALNVNQLQNSGWNLDSK
					~ ~									

```
probable adhesin ECs4480 [similarity] - Escherichia coli (strain 0157:H7, substrain C;Species: Escherichia coli c;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 02-Nov-2001 C;Accession: H91188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            R;Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, gasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shinagawa,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 망
                                                                                                         Вþ
                                                                                                                                         Qy
                                                                                                                                                                                 рь
                                                                                                                                                                                                                                                                                                                                                                                 A;Cross-references: GB:BA000007; PIDN:BAB37903.1; PID:g13363955; GSPDB:GN00154 A;Experimental source: strain 0157:H7, substrain RIMD 0509952
                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-1588 <HAY>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA Res. 8, 11-22, 2001
A;Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7.
A;Reference number: A99629; MUID:21156231; PMID:11258796
A;Accession: H91188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
QΥ
                                   밁
                                                                   Ş
                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                               A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Status: preliminary
                                                                                                                                                                                                                                                      Query Match
Best Local S
Matches 174
                                                                                                                                                                                                                                                                                                                                                                  Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               360
 151
                                     971
                                                                         115
                                                                                                                                                                                 088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    220
                                                                                                                                               61
                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                               ECs4480
                                   LDDNALLWDETANGGAGAYNASHDGKASIITNVANGSISEDSTDAVNGSQLNATNMMIEQ 1030
                                                                                                                                                                                 LLWDADAGENGAFSA --
                                                                                                                                                                                                                   IIW-----NSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVSMVSANGRWVYKLQGSTNSQGEYSAALGAGIQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QYTDQRMVEMDNKLSKTESKLSGGTASAMAMTGLPQAYTPGASMASIGGGTYNGESAVAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRITNVAAGKNATDAVNVAQLKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTDSLAMGAKTIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAIGNGSTTTRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VAIGQGSYSDVDTGIALGSSSVSSRVIAKGSRDTSITENGVVIGYDTTDGELLGALSIGD
 NSNKVN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEAGGVRYDTKADGSIDYSNITLGGGNGG-TTRISNVSAGVNNNDVVNYAQLKQSVQETK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KAVAGSSGKVISGNVSPSKGKM---DETVNINAGNNIEITRN---GKNIDIATSMTPQFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AQVSQNTQ-SITNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGVDASAQGKDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATVSKDDQGNITVM-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AQTNYTAYNMDAPQNSVGEFSVGSADGQRQITNVAAGSAD----TDAVNV--GQLKVTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   V-----TDAVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTNVTFASGKGTT
                                                                                                                                             PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITL-----KAGDNLKI 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -RTEVKIGAKTSVIKEK-----DGKLVTGKDKGEND----SSTDKGEGLVTAKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK---
                                                                                                           -TTNKYIADALG-GDAEVNAD---
                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -NLNNHIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----VADGSEAHDAVT-VRQLQNAIGAVATTPTKYFHANSTEEDSLAV
                                                                                                                                                                                                                                                                    12.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----YDVNVGDAL------NVNQLQNSGWNLDS
                                                                                                                                                                                                                                                        94;
                                                                                                                                                                                                                                                     Score 368.5; DB 2;
Pred. No. 7.4e-11;
4; Mismatches 274;
                                                                                                                                                                                 -AHGKDKTASVITNV-ANGAISAASSDAINGSQLY--
ITSDTKGLNFAKKTAETNGDTTVHLNGI-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    594
                                                                                                         -GTITAPTYTIANAEYNNVGDALDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1588
                                                                       SLKKDLTDL - - TSVGTEKLSFSA
                                                                                                                                                                                                                                                                                        Length 1588;
                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                      213;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Yokoyama, K.;
Shinagawa, H.
                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1262
 184
                                                                       150
                                                                                                         970
                                                                                                                                                                                 927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         314
                                                                                                                                                                                                                                                      31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Han,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RIMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ġ
```

```
probable surface protein (partial) YPO0902 [imported] - Yersinia pestis (strain C;Species: Yersinia pestis C;Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001 C;Accession: AH0110
δ
                                                                                                                                                                                                                   A;Cross-references: GB:AL590842; PIDN:CAC89747.1; PID:g15978974; GSPDB:GN00175 C;Genetics: A;Gene: YP00902
                                                                                                                                                                                                                                                                                                                                                                                                R;Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, Il, M.; Rttherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barre Nature 413, 523-527, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                       B
                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                        A; Reference number: AB0001; A; Accession: AH0110
                                                                                                                                                                                                                                                                           A; Molecule type: DNA
A; Residues: 1-658 < KUR>
                                                                                                                                                                                                                                                                                                                     A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                          A;Title: Genome sequence of Yersinia pestis, the causative agent of plague A;Reference number: AB0001; MUID:21470413; PMID:11586360
                                                                                                                    Matches 132;
                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
  159
                                                                              99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | : : | |
| NTQIINQLAGNTDATYIQENGAGINYVRTNDDGLAFNDASAQGVGATAIGYNSVAKGDSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GVSMVSANGRWVYKLQGSTNSQGEYSAALGAGIQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQ----
SDTKGLNFAKKTAETNGDTTVHLNGIGSTLTDTLLNTGATTNVTN--DNVTDDEKKRAAS 216
                                                                            LTAGTITLKAGDNLKIKQNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNIT 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----NLNNHIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEAGGVRYDTKADGSIDYSNITLGGGNGG-TTRISNVSAGVNNNDVVNYAQLKQSVQETK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRITNVAAGKNATDAVNVAQLKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KAVAGSSGKVISGNVSPSKGKM---DETVNINAGNNIEITRN---GKNIDIATSMTPQFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AQVSQNTQ-SITNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGVDASAQGKDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATVSKDDQGNITVM----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AQTNYTAYNMDAPQNSVGEFSVGSADGQRQITNVAAGSAD ----TDAVNV--GQLKVTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      V-----TGQADKFETVTSGTNVTFASGKGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GTDSLAMGAKTIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAIGNGSTTTRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -RTEVKIGAKTSVIKEK------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DGKYRQIIN-----VADGSEAHDAVT-VRQLQNAIGAVATTPTKYFHANSTEEDSLAV 1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VAIGQGSYSDVDTGIALGSSSVSSRVIAKGSRDTSITENGVVIGYDTTDGELLGALSIGD 1150
                                                                                                                      Conservative
                                       NSIALGAASINTVGAQSSYSAYALTAPQASVGELGIGTALGNRKIT--
                                                                                                                  11.0%; Score 3
25.0%; Pred. I
ative 73; Misn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --GSTLTDTLLNTGA-TTNVTNDNV----TDDEKKRAASVKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---YDVNVGDAL----
                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -DGKLVTGKDKGEND----SSTDKGEGLVTAKE
                                                                                                                  e 331.5; DB 2;
. No. 1.7e-09;
ismatches 209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    594
                                                                                                                      Indels 113;
                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -NVNQLQNSGWNLDS
                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       314
                                         269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    270
                                                                                                                      21;
                                                                                                                                                                                                                                                                                                                                                                                                                         tice, M
ugan, G
Barrel
```

C092)

밁

270

-----GVAAGSASSDAVNVAQLTAVGDQVQQN----

-TANITSLGGRVTTIE----GS

```
A; Molecule type: DNA
A; Residues: 1-1091 <BLAT>
A; Cross-references: GB:AE000291; GB:U00096; NID:g1788298;
A; Experimental source: strain K-12, substrain MG1655
C; Keywords: nucleotide binding; P-loop
F; 683-690/Region: nucleotide-binding motif A (P-loop)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         hypothetical protein b2000 - Escherichia coli
C:Species: Escherichia coli
C:Date: 12-Sep-1997 #sequence_revision 17-Sep-1997 #text_change 02-Feb-2001
C:Accession: G64964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                            δõ
                                                                                                                                                                           망
                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                           뮹
                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Title: The complete genome sequence of Escherichia coli K-12
A;Reference number: A64720; MUID:97426617
A;Accession: G64964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .A.; Rose, D.J.; Mau, B.; Sh
Science 277, 1453-1462, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
•망
                                          20
                                                                                      뮹
                                                                                                                                                                                                                                                                                                                                                                                      QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   R;Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.; Riley, .A.; Rose, D.J.; Mau, B.; Shao, Y.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Status: nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  405
229
                                                                                                                                                                                                                                                                111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                612 AASYRGQSALSLGVSSISDSGRWVSKLQASSNTQGDFGIGVGVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                    57
                                                                                                                                   LNGIGSTL ---- TDTLLNTG ----
                                                                                                                                                                                                                   NTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVH 180
                                                                                                                                                                                                                                                                                                          PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
                                                                                                                                                                                                                                                                                                                                                                                    MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VAQLKGVAQNLNNHIDNVDGNAR------AGIAQAIATAGLVQAYLPGKSMMAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GNNSTAFGSGAKATAANSAALGANSVADRANSVSVGSVGNER---QITNVAPATQGTDAVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QFSSVSLGAGADAPTLS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EITRNGKNIDI--ATSMTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AGAVAIG---DGAAASADGSVAIGQGSGDN------GRGV---ENYIGKYSNA-----SNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --EVKIGAKTSVIKEKDGKLVTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRT----
    --VKPGTVATDTV--VNTGAEGGPDAENGDTGQFVRGDAVRTTIN----KNGRQIVRAEG
                                              KGVKPGTTASDNVDFVRT------YDTVEFLSADTKTTTVNVESKDNGKRTEVKIG
                                                                                         AGG-GQSLQGRAVNTTLNGGEQWMHEGAIATGTVINDK--
                                                                                                                                                                           MTISTGLEYGPDNE----ANTGGQWVQDGGTANKTTVTSG--GLQRVNPGGSVS-DTVIS 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FDQLKSISNQTNAYTNQRYSELKQDLRKQNSVLSAGIASAMSMASLTQPYTSGSSMTTIG
                                                                                                                                                                                                                                                                                                                                                    LNTCYRLVWNHMTGAFVVASELARARGKRGGVAVALSLAAVTSLPVLAA------DIVVH 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ····IAASIVVVENNVSGLQNGTDGMFQVNNSSGLAKPSATGANSATGGAGSVAS
                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----TVSVGNTAT----GETRTVSNVADG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                         8.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Shao,
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 244; DB 2; Pred. No. 8.3e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   - VDDEGALNVGSKDANKPVRITNVAPGVKEGDVTN
                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches 215;
                                                                                                                                 -ATTNVTNDNVTDDEKKRAASVKDVLNAGWNI 227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --- ASGTNSVAIGPASLASGNAALASG
                                                                                                                                                                                                                                                                TVNGGTLANHDNQIVFGTTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----LQATDAVNLRQLDG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1091;
                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIDN: AAC75061.1;
                                                                                         -GWQV
                                              277
                                                                                         228
                                                                                                                                                                                                                                                                134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  404
    280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PID:g1788309
                                                                                                                                                                                                                                                                                                                                                                                                                                       28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         :X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ဂ္ဂ
```

Qy Qy

DDDDLYLEPVQRTA---VVLSFRSDKEGTGEKEVTEDS-----NWGV-----

--SPAMYTASKVMVAHVDSQVNRTADRIPTGDGSELMTHMALDWKFFPFGNNSIA 116

NKIYRIIWNSALNAWVAVSELTRN------HTKRASATVATAVLATLLFATVQASTT 52

NQIYRKFWNLSLGSWSVASHMTNDGGCSDVVLRHSGVRNRSLVLAIGLALTSVTHAQSVK 63

53 64 Matches

Conservative

96;

Mismatches

33;

```
A;Experimental source: strain 9a5c

A;Experimental source: strain 9a5c

A;Experimental source: strain 9a5c

R;Simpson, A,J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R. Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer as Neto, E.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Ferreira, A.J.S.

submitted to GenBank, June 2000

A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; La chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins A;Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Migaki, C., F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A;Authors: da Silva, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A;Authors: da Silva, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A;Authors: da Silva, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A;Authors: da Silva, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A;Authors: da Silva, A.J.; Van Silva, A.A.; Silva Jr., W.A.; da Silva, A.;Reference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nature 406, 151-157, 2000
A;Title: The genome sequence of the plant pathogen Xylella fastidiosa. A;Reference number: A82515; MUID:20365717
A;Note: for a complete list of authors see reference number A59328 bel A;Accession: C82672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C82672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Molecule type: DNA
A;Residues: 1-1004 <SIM>
A;Cross-references: GB:AE003981; GB:AE003849; NID:g9106543; PIDN:AAF84325.1; GSPDB:GN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C; Species: Xylella fastidiosa
C; Date: 18-Aug-2000 #sequence_revision
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R;anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C; Accession: C82672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              surface-exposed outer membrane protein XF1516 [imported] - Xylella fastidiosa
                                                                                                                                                                                                   ;Contents: annotation
Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          442 ATSMTPQFSSVSLGA-----GADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             281 TANTTVVYAGGDQTVHGH---ALDTTLNGGYQYVHNGGTASDTV--VNSDGWQIVKNGGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GYAIGYSSISDGGNWIIKGTASGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDI 441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTLAGTTTLNNGAILTLSGKTVNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LTGHTATNTRVDDGGTLDVRNGGTATTVSMGNGGVLLADSGAAVSGTRSDGKAFSIGGGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -GINRL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGNTTVN-QKGRL-QVDAGGTATNVTLKQGGALVTSTAATVT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -KTTTANGQTGQADKFETVTSGTNVTFASG----KGTTATVSKDDQGNITVMYDVNVGDA 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -AKTSVIKEKDGKLVTGKDKGENDSSTDKGEGLV----TAKEVIDAVNKAGWRM-----
      Similarity
   7.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----AGDTATDTT
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----GAFSVVEGKADNVV-
   Score 239; DB 2; Pred. No. 0.00013;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           #text_change 20-Aug-2000
                                  Length 1004;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---LENGGRLDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (strain
```

```
RESULT 12
A41477
A41477
190K surface antigen precursor - Rickettsia rickettsii
C;Species: Rickettsia rickettsii
C;Species: Rickettsia rickettsii
C;Species: Rickettsia rickettsii
C;Date: 16-Sep-1992 #sequence_revision 16-Sep-1992 #text_change 08-0
C;Accession: A41477
R;Anderson, BE.; McDonald, G.A.; Jones, D.C.; Regnery, R.L.
Infect. Immun. 58, 2760-2769, 1990
A;Title: A protective protein antigen of Rickettsia rickettsii has t
A;Reference number: A41477; MUID:90354033
A;Accession: A41477
A;Residues: 1-2249 <AND>
A;Cross-references: GB:M31227; NID:9152465; PIDN:AAA26380.1; PID:91-A;Cross-references: GB:M31227; NID:9152465; PIDN:AAA26380.1; PID:91-A;Note: the authors translated the codon GAT for residue 430 as Gly
C;Keywords: surface antigen; tandem repeat
F;1-20/Domain: signal sequence (uncleaved) #status predicted <SIGU>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
δõ
                                         В
                                                                             οy
                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                Ş
                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    138
    118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           117
                                                                                                                                                             13 LNAWVAVSELTRN--HTKRASATVATAVLATLLFATVQASTTDDDDL-----YLEPVQRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ANSTALGGOSTAISEGGTSLG---YNSFYGOSATNGIALGSN-----AIVSGYNSVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         V--TSGTNVTFASGKGTTAT-VSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DVAASVKKIVGTIQITGSGVASAIGKDSTATGASAQAVGDSSVALGTRATANAIGSSVLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N---HIDNVDGNAR---AGIAQAI---ATAGLVQAYLPGKSMMAIG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AIQITGSGVASVSGQDSTAAGASAQAAGDSSIA----LGARSRANAIGSSALGVDGHALG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ASEPNYVSVGSGDGLRGPAVRRIVNVGDGIGNNDAVNKSQLDGVTASVNDVVASVKNIAG
  TNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDT
                                         GAIDSTGNANNGIVTFTGNSTVTGDIG-----NTNALATVNVGAGTATL---GGAVIKAT 751
                                                                                    AVVLSFRSDKEG---
                                                                                                                           LNLNGALSQVTGDIGNTNSLATISVGAGTATLGGAVIKATTTKITNAVSAVKFTNPVVVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VDSRARGINSTALGROSNAIGDGSVSLGFNSFVRQSGEHGVALGTDAGVSGKDSIALGY 678
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----GGTYRGEAGYAIGYSSISDGGNWIIK-----GTASGNSRGHFGA-SASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --SKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -KGENDSSTDKGEGL--VTAKEVI------DAVNKAGWRMKTTTANGQTGQADKFET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AKGINSTTVGTQSVSLGQGGVSLGYNSFVGEGSFNGLALGSNSLVLLQGVDSVALGSGSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TNQVTGSSVA-----SASGKESTAIGSGAQAVADNTVAFGGRAIANAVG-ASALGFDSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVHLNGIGSTLTDTLLNTGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LGAGSVASELNV-----ISVGGGDGVTGPAVRRIVNVGDGIGNNDAVNKSQLDGVTASVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LGAGADAPTLSVDDEGALNVGSKD-ANKPV--RITNVAPGVKEGDVTNVAQLKGVAQNLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----KTTTVNVESKD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ISVGGGDGVTGPAVRRIVNV-GDGIGNNDAVNKSQLDG-VTASVNDVAASVKTIAL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IGYFSKAFAPNA----IALGYNSSVTQSANNGVALGSNSTVSGVNSVALGAGSMASELNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --YFDKKGVLTAGTITLKAGDNLKIKQNTN-----ENTNASSFTY-----SLKKDLTD
                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                              7.48; 24.28;
                                                                   -TGEKEVTEDSNWGVYFDKKGVLT----AGTITLKAGDNLKIKQN 117
                                                                                                                                                                                                         Score 224; DB 2;
Pred. No. 0.0021;
'3; Mismatches 256;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---NGKRTEVKIGAKTSVIKEKDGKLVTGKD--
                                                                                                                                                                                                                                                Length 2249;
                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                     PID:g152466 as Gly, and
                                                                                                                                                                                                                                                                                                                 <SIGU>
                                                                                                                                                                                                           206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 has tandemly repeated,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   08-Oct-1999
                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           592
    177
                                                                                                                             699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  197
                                                                                                                                                                                                                                                                                                                                                          CAA for
                                                                                                                                                                                                           34;
                                                                                                                                                                                                                                                                                                                                                          residu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ņ
  밁
```

```
probable adhesin PA4082 [imported] - Pseudomonas aeruginosa (strain PAO1) C:Species: Pseudomonas aeruginosa (C:Species: Pseudomonas aeruginosa (C:Date: 15-Sep-2000 #sequence_revision 15-Sep-2000 #text_change 31-Dec-2000 C:Accession: H83135 R:Stover, C.K.; Pham, X.Q.; Erwin, A.L.; Mizoguchi, S.D.; Warrener, P.; Hicladhan, S.; Yuan, Y.; Brody, L.L.; Coulter, S.N.; Folger, K.R.; Kas, A.; Lari
                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1076
                                                                                                                                                                                                                                               1221 GAIANGNNAILNVNTKLLTASHLTIGTVAEINIGAGNLFTIDASVG
                                                                                                                                                                                                                                                                                                                                      1170 NALATYNYGAGITLQA---GGSLAANNIDFGARSTLEFNGPLDGG-----GKAIPYYFK 1220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1023 -----GNTNALATYNVGAGL--LQVQGGVVKANTINLTDNASAVTFTNPVVVTGAIDNTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    423 NINAG-----ADAPTLSVDDEG 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         752 TTKLTNAASVL-----TLTNANAVLTGAIDNTTGGDNVGV------LNLNGALSQVTGD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          310 VTA-----KEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        905 LTNAASVLTLTNANAVLTGAIDNTTGGDNVGVLNLNGALSQVTG-DIGNTNSLATISVGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      854 TGGDNVGVLNLNGALSQVTGDIGNT---
                                                                                                                                                                                                                                                                                          SSISDGGNWIIK----
                                                                                                                                                                                                                                                                                                                                                              ALNYGSKDANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNHIDNYDGNARA----GIA 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NANNGIVTFTGNSTVTGNVGN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTATLGGAVIKATTTKLTDAASAVKFTNPVVVTGAIDNTGNANNGI-VTFTGNSTVTGNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKT----SVIKEKDGK
                                                                                                                                                                                                                                                                                                                                                                                                                             S-----NANNGIVTFTN--PVVVTGAIDNTG-----NANNGIVTFTGNSTVTGDIGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV 422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----IGNTNSLATISVGAGTATLGGAVIKATTTKLTNAASVLTLTNANAVLTGAVDNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TVHLNGIGSTLTDTLLNTGATTNVTNDNV---TDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                          -GTASGNSRGH---FGASASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -TNALATVNVGAGLLQVQGGVVKANTINLTDNA 1128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----NSLAT-ISVGAGTATLGGAVIKATTTK
                                                                                                                                                                                                                                                                                                                                                                                    ----IGGGTYRGEAGYAIGY---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      - VTGKDKGENDSSTDKGEGL
                                                                                                                                                                                                                                                 1266
                                                                                                                                                                                                                                                                                          591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      289
                                                                                                                                                                                                                                                                                                                                                                                      561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             234
```

δ 밁 Š A;Molecule type: DNA A;Residues: 1-1018 <STO> A;Cross-references: GB:AE004824; GB:AE004091; NID:g9950277; PIDN:AAG07469.1; GSPDB:GN A;Title: Complete genome sequence of Pseudomonas A;Reference number: A82950; MUID:20437337 A;Accession: H83135 A; Experimental source: strain PAO1 C; Genetics: .; Lory, S.; Olson, M.V. Nature 406, 959-964, 2000 A; Status: preliminary Query Match
Best Local Similarity 55 61 PSGGTVV--PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE MNKCYALVWNVSQGCWNVVSEGSRRRGKPAGAKAAIASVLALLGATALAPA-----Conservative 7.4%; Score 222; DB 2; Pred. No. 0.00097; Mismatches -GGSANGEIHLSGGNSLSVNQKVDK aeruginosa Length 1018; Indels PA01, 196; an TAY Gaps opportunistic 120 ; Hickey, ; Larbig, 54 28;

pa

1052

```
A; Molecule type: DNA
A; Residues: 1-1536 <BAR>
A; Cross-references: GB:U08876; GB:M84616; NID:g475770; PIDN:AAA20527.1;
A; Note: sequence inconsistent with the nucleotide translation
A; Note: sequence extracted from NCBI backbone (NCBIN:89235, NCBIP:89239)
                                                                                                          δÃ
                                                                                                                                                                                QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        high-molecular-weight surface-exposed protein c;Species: Haemophilus influenzae C;Date: 10-Mar-1993 #sequence_revision 18-Nov-C;Accession: A43855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
1 망
                                        Ş
                                                                             Ъ
                                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                 A; Reference number: A43855; A; Accession: A43855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R; Barenkamp, S.J.; Leininger, Infect. Immun. 60, 1302-1313,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               D
                                                                                                                                                                                                                                                                                                                                                                                                  A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                      detella pertussis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Title: Cloning,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                      Query Match
Best Local
   881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       134
                                                                               821
                                                                                                                149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          177
                                            193
                                                                                                                                                   766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                    98
                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14
                                                                                                                                                                                VLTAGTITLKAGDNLKIKQNTNENTNASSFTYSLKKDLT-----DLTSV---GTEKLSF
         INSGNLTAGGNIVNIAGNLTVESN--
                                          LNTGATT --- NVTN -- DNVTDDEKKRAASVKDVLNAGWNIKGV---
                                                                             KGIVAKKNITFEGGNITFGSRKAVTEIEGNVTINNNANVTLIGSDFDNHQKPLTIKKDVI
                                                                                                                SANSNKVNITSDTKGLNFAKKTA--ETNGDTTVHLNG----IGSTL--
                                                                                                                                                 VINSKYFNVSTGSSLRFKTSGSTKTG-----FSIEKDLTLNATGGNITLLQVEGTDGMIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VLGGNILGGSYYCTA-------LQSIGGPAGVFSGTLDGLGNSIGNLSISNTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGG--GTYRGE---AGYAIGYSSISDGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AGWNIKGVKPGTTA-----SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        T-TVHLNGIGSTLTDTLLNTGATTNV-----TNDNVTDDE-----KKRAASVKDVLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -NTNASSETYSLKKDLTDLTSVGTEKLSF---SANSNKVNITSDTKGLNFAKKTAETNGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGAGSALAMDAGEGHRVNGTASVSLAGANATYVSGGYYYTVVQNLAQLQAINKNLDG-LY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SGNRLGLGSAADLTLNGR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGNNI-----EITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SNGLNGTWKIAADKIDVRPSAVSDGVTVHADTLSRNLASTNIELVSTKGDLDLDGSVNWA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AGVANALASNGGLL --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AKTSVIKEKDGKLVTGKDKGENDSSTDKGEGLV---TAKEVIDAVNKAGWRMKTTTANGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HGGAITAAEGGSIALLGAQVDNRGTVLAQMGGVGLGAGSDLTL----NFDGNKLLDIRVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGRIVLDGGPDGKVMVGGALSANALNGPGHGGTVEVRGQA-----VEVALGTQVNTLA
                                                                                                                                                                                                                         130;
                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---ADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       expression,
                                                                                                                                                                                                                                      7.38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -LFGRGAQVNVGGLVASTLDITDAEFNGNSSRYRFTGPSTNGVLN
                                                                                                                                                                                                                                                                                                                                                                                                                                     MUID:92192797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       E.
1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -AGERVIFNQPSSSSIALNRVIGTKASDIQGR-IDANGQ
                                                                                                                                                                                                                       88;
                                                                                                                                                                                                                     Score 220; DB
Pred. No. 0.00
88; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -KADGGRVLMAARTANALLNTVVNSQGAIEARSLRGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNA
         ANFKAITNFTFNVGGLFDNKGNSNISIAKGGAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18-Nov-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -TNVAPGVKEGDVTNVAQLKGVAQNLNNHID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----LNASGAKAGLELKAEGAIDINDKIVL
                                                                                                                                                                                                                                      DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HMW1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        analysis
                                                                                                                                                                                                                       210;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           #text_change
                                                                                                                                                                                                                                                      Length 1536;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Haemophilus influenzae
                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       genes
                                                                                                                                                                                                                       144;
                                            ·-KPGTT
                                                                                                                --TDTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             08-Oct-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       encoding
                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        554
                                                                             880
                                                                                                                192
                                                                                                                                                 820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                334
         937
                                            235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        222
                                                                                                                                                                                                                                                                                                                                             PID: 9475771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nontypeable
                                                                                                                                                                                                                       30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type: DNA
A; Residues: 1-1286 (BEN)
A; Cross-references: EMBL: X65022; NID: 942254;
R; Benz, I; Schmidt, M.A.
Mol. Microbiol. 6, 1539-1546, 1992
A; Title: AIDA-T, the adhesin involved in diff
                                                       C;Keywords: membrane protein
F;1-49/Domain: signal sequence #status predicted <S:
F;50-1286/Product: adhesin AIDA-I #status predicted
                                                                                                                                                                                                 A; Experimental source: strain 2787
R; Suhr, M.; Benz, I; Schmidt, M.A.
Mol. Microbiol. 22, 31-42, 192.
A; Title: Processing of the AIDA-I precursor:
A; Reference number: $72657; MUID:97055419
A; Accession: $72657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    adhesin AIDA-I precursor - Escherichia coli plasmid pIB6 C;Species: Escherichia coli C;Species: Escherichia coli C;Date: 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change C;Accession: S28634; S22680; S28881; S72657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                    A; Molecule type: protein A; Residues: 847-856 < SUH>
                                                                                                                                                                                                                                                                                                            A; Molecule type: protein A; Residues: 50-56 <BE3>
                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: DNA
A; Residues: 839-1286 <BE2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Reference number: S22680;
A; Accession: S22680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                              C; Genetics:
A; Genome: F
                                                                                                                                                                                                                                                                                                                                               A; Accession: S28881
                                                                                                                                                                                                                                                                                                                                                              A; Experimental source: strain
                                                                                                                                                                                                                                                                                                                                                                              A; Cross-references: EMBL: X65022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Accession: S28634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Reference number:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   submitted to the EMBL Data
                                                                                                                                                 A; Experimental source:
                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Status: nucleic acid sequence
       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1053
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TT -- GEANVTSATGTIG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTYRGEAGYAIGYSSISDGGNWIIKGTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FKDIDNSKNLSITTNSSSTYRTIISGNITNKNGDLNITNE--GSDTEMQIGGDVS---QK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTTINATTGNVEITAQTGSILGGIESSSGSVTLTATEGALAVSNISGN-----TVTVTA 1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKNIDIAT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GDALNVNQ---LQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TTAN----
                                                                                                              plasmid pIB6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KEGDVTNVA--QLKGV-AQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGG 548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SGSNNNTEDSSDNNAGLTIDAKNV-----TVNNNITSHK-----AVSISATSGEITTKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ITAKDGSDLTIGNTNSAD-----GTNAKKVTFNQVKDSKISA---DGHKVTLHSKVET 1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EGNLTISSDKINITKQITIKAGVDGENSDSDATNNANLTIKTKELKLTQDLNISGFNKAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DGKLVTGKDK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ASD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NSGALTTLAGSTIKGTESVTTSSQSGDIGGTISGGTVEVKATESLTT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S28634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -SMTPQFSSVSLGAGADAPTLSVD-DEGALNVGSKDANKPVRITNVAPGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GQTGQADKFETVTSGTN----VTFASGKGTTATVSKDDQGNITVMYDVNV 378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEK
                                                                                                                                                   DAEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Library,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MUID: 92326638
                                                                                                                                                   strain
                                                                                                                                                                                                                                                                                                                                                               2787
                                                                                                                                                                                                                                                                                                                                                                                                                                     not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENDSSTDKGEGLVTAK - - - - EVIDAVNKAGWRMKT
       Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -GTISGNT
                                                                                                                                                   2787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     March
         219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         diffuse adherence of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PIDN:CAA46156.1;
                                                                                                                                                                                                                                        removal of AIDA and
       DΒ
       2
                                                            I <MAT>
     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the diarrhoeagenic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PID:g42255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -QSNSKIKA 1260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         08-Oct-1999
```

evidence

for the

out

Esch

	TAGLVQAYLPGKSMAIGGGTYRGEAGYAIGYSSISDGGN 569		530 596	р 9
	SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIA 529 : :   :   :           :   :		475 549	DP QV
	TSMTPQFSSVSLGAGADAPTLSVDDEGALN		443 496	Qy Db
	AVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIA 442 		398 436	β δ
	KGTTATVSKDDQGNITVMYDVNVGD-ALNVNQLQNSGWNLDSK 397		356 376	Qу
	TDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASG 355		303 325	Оy
	VRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKGENDSS 302		243 271	Оγ
	GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF 242		183 222	од Qy
	KDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVHLN 182 		133 167	Qy Db
	L		112 108	Оy
	TDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDN 111		52 61	D Q
	MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQAST 51 		1 1	B 6
30;	9%; Pred. No. 0.0018; 96; Mismatches 256; Indels 202; Gaps	Local Similarity 20. hes 146; Conservative	Best Lo Matches	

Search completed: July 3, 2002, 08:12:18 Job time: 440 sec

THIS PAGE BLANK (USPTO)

```
GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
```

OM protein - protein search, using sw model

Run on: July 3, 2002, 08:29:54; Search time 48.34 Seconds
(without alignments)
475.784 Million cell updates/sec

Title: Perfect score:

Sequence: US-09-771-382-4 3019 1 MNKIYRIIWNSALNAWVAVS......TASGNSRGHFGASASVGYQW 594

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

105224 seqs, 38719550 residues

Searched:

Total number of hits satisfying chosen parameters: 105224

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

Database : SwissProt\_40:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

30 31 33	26 27 28 29	20 21 22 23 24	15 16 17 18	10 12 13 14	07654321	Result
165 164.5 163.5 162.5	165.5 165 165 165	172.5 171.5 170.5 170.5 169	187 180.5 176 173 172.5	195 194.5 193 192.5 192.5	244 224 219 216.5 204.5 203 198	Score
	ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.ភ.		5.7 5.7 5.7	0000000 0000000 000444	0.0007778	Query Match
1007 1025 1276 1167	1036 642 928 928	3591 1861 917 1656 1770	1569 918 1228 1300	1953 1953 2021 1645 1655	1039 2249 1286 1325 1577 1608 2003	Length D
<u> </u>						DB
Y741_CHLMU SLAP_CAUCR PMP6_CHLPN CAGA_HELPJ	HPI2_DEIRA FLID_CAMJE HXA2_HAEIN PM10_CHLPN	FHAB BORPE APU_THETU HXA3_HAEIN OMPB_RICJA PMPC_CHLTR OMPPRICPR	YPJA_ECOLI YMJB_CAEEL SLAP_BCST 120K_RICRI TCEN_XANCT	OMPB_RICKI SIAP_CAMFE OMPB_RICCN OMPB_RICTY OMPB_RICCN OMPB_RICTN	AG43_ECOLI OMPA_RICRI AIDA_ECOLI YDEK_ECOLI HLYA_PROMI HLYA_SERMA YDBA_ECOLI	ID
chlamydia caulobacte chlamydia helicobact	P13126 deinococcus O9phw6 campylobact P45354 haemophilus O9rb65 chlamydia p			Q394/ r Outer mem P25927 salmonella P35827 campylobact Q52657 rickettsia P96989 r outer mem Q9kka3 r outer mem Q9kka3 r outer sem	es es es	Description

44	42	39 40	37	35.4
155.5	158	159 158.5	160.5	161 160.5
5.0	5000	ກ ເກ ເກ ນ ພ ພ	υυ. ωω.	ກ ທ ທ ພ ພ
1902	730	1291	2476	1848 671
<b>-</b> -		ـــ ـــ ـــ		
P1P_LACLC	GLN3_YEAST P60_LISIV	FLIC_SHIFL VAC4_HELPY	YRC3_RELFT ATRX_MOUSE YS89_CAEEL	CBPA_CLOCL ALYS_ENTFA
	P18494 saccharomyc Q01837 listeria iv		Q61687 mus musculu Q09624 caenorhabdi	

## ALIGNMENTS

H > X (1 10 )	254442×110	2 [ ] (1.0 )	46992	2 2 2 2 2 X X X X X X	2 (. 1-) 2 2 2 2 2 3 1 1 0 2	343_E 343_E 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
SEQUENCE OF 53-63. STRAIN-K12 / EMG2; MEDLINE-97443975; PubMed-9298646; Link A.J., Robison K., Church G.M.; Comparing the predicted and observed properties of proteins encoded	PRELIMINARY SEQUENCE OF 53-78.  STRAIN-ML 308-225;  MEDLIND-89291704; PubMed-2661530;  Caffrey P., Owen P.;  "Purification and N-terminal sequence of the alpha subunit of antigen Parification complex associated with the outer membrane of Escherichia coli.";  J. Bacteriol. 171:3634-3640(1989).	SEQUENCE FROM N.A. STRAIN-ML 308-225; Henderson I.R., Owen P.; Submitted (JAN-1997) to the EMBL/GenBank/DDBJ databases.	namoto Y., Horiuchi T.; 460-kb DNA sequence of the Escherichia coli K-12 genome responding to the 40.1-50.0 min region on the linkage mes. 3:379-392(1996).	SEQUENCE FROM N.A.  STRAIN-K12;  MEDLINE-97251358; PubMed-9097040;  MEDLINE-97251358; PubMed-9097040;  Itoh T., Aiba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K.,  Kasai H., Kinura S., Kitakawa M., Kitagawa M., Makino K., Miki T.,  Mizobuchi K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Y.,  Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y.,  Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y.,  Sivasundaram S., Taqami H., Takeda J., Takemoto K., Wada C.,	SEQUENCE FROM N.A. SEQUENCE FROM N.A. SEQUENCE FROM N.A. STRAIN-K12 / MG1655; STRAIN-K12 / MG1655; STRAIN-K12 / MG1655; STRAINE-97426617; PubMed-9278503; MEDLINE-97426617; PubMed 9278503; Blatther F. R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V., Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Mau B., Shao Y.; "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).	LT 1  ECOLI STANDARD; PRT; 1039 AA.  AG43_ECOLI STANDARD; PRT; 1039 AA.  P39180; P76360; P75614; P97241; Q46771;  01-FEB-1995 (Rel. 31, Created)  01-NOV-1997 (Rel. 35, Last sequence update)  16-OCT-2001 (Rel. 40, Last annotation update)  Antigen 43 precursor (AG43) (Fluffing protein).  ESCherichia coli.  Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;  ESCHERICHia.  NCBI_TaxID=562;

```
Дb
                   Q
                                         DЬ
                                                              δÃ
                                                                                       Matches
                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                      VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        entities
or send a
                                                                                                                                             VARIANT
CONFLICT
SEQUENCE
                                                                                                                                                                                        VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                     VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                            CHAIN
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss institute of Bioinformatics and the EMBL outstation the European Bioinformatics institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEMS Microbiol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        in the genome of Escherichia coli K-12."; Electrophoresis 18:1259-1313(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Outer membrane;
                                                                                                                                                                                                                                                                                VARIANT
                                                                                                                                                                                                                                                                                           VARIANT
                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                            VARIANI
                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                   SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL;
                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                               VARIAND
                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                 VARIANT
59
                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CHAIN).
SUBCELLULAR LOCATION:
SIMILARITY: TO ADHESI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FUNCTION AS AN ADHESIN.
SUBUNIT: HETERODIMER OF THE PERIPHERAL MEMBRANE PROTEIN (ALPHA CHAIN) ANCHORED TO THE INTEGRAL OUTER MEMBRANE PROTEIN (BETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FUNCTION:
                   PVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNE 120
                                           LNTCYRLVWNHMTGAFVVASELARARGKRGGVAVALSLAAVTSLPVLAA------DIVVH
                                                                MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        s requires a license agreement (
an email to license@isb-sib.ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and this statement is not removed.
                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONTROLS COLONY FORM VARIATION AND AUTOAGGREGATION.
                                                                                                                             1025
63
106841 M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TO ADHESIN AIDI-I
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Signal; Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                            551
1039
                                                                                                                                                                                                                        157
188
305
320
372
372
493
497
709
7721
7721
753
803
                                                                                                 8.1%;
22.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OUTER MEMBRANE ASSOCIATED.
N AIDI-I AND TO BORDETELLA PERTACTIN.
                                                                                                                                                                                                                                 T -> K (IN STRAIN ML 308-225).

W -> L (IN STRAIN ML 308-225).

V -> F (IN STRAIN ML 308-225).

ATN -> STI (IN STRAIN ML 308-225).

A -> T (IN STRAIN ML 308-225).

N -> Q (IN STRAIN ML 308-225).

E -> V (IN STRAIN ML 308-225).

F -> V (IN STRAIN ML 308-225).

H -> T (IN STRAIN ML 308-225).

H -> T (IN STRAIN ML 308-225).

E -> K (IN STRAIN ML 308-225).

E -> K (IN STRAIN ML 308-225).

GHL -> SHF (IN STRAIN ML 308-225).

GHL -> SHF (IN STRAIN ML 308-225).

S -> P (IN STRAIN ML 308-225).

C -> S (IN STRAIN ML 308-225).
                                                                                       64;
                                                                                                                                          LNLVHTS
225)
QGT -> I
S -> T
Q -> L
S -> I
ETV ->
MW; 517
                                                                                                                                                                                                                                                                                                                                                                   ANTIGEN 43 J
ANTIGEN 43 I
K -> N (IN 8
SL -> FF (II
T -> K (IN 8
W -> L (IN 1
V -> F (IN 1
                                                                                               Score 244; DB 1;
Pred. No. 4.6e-05;
                                                                                                                                                                                                                                                                                                                                                                                      NTIGEN 43 BETA CHAIN.

-> N (IN STRAIN ML 308-225).

-> FF (IN STRAIN ML 308-225).

-> K (IN STRAIN ML 308-225).
                                                                                       Mismatches
                                                                                                                                               5170D647C8DEEBE0
                                                                                                                                                         -> LGA
T (IN
I (IN
I (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (See http://www.isb-sib.ch/announce/
                                                                                                                                                      A (IN STRAIN ML 308-225).

IN STRAIN ML 308-225).

IN STRAIN ML 308-225).

IN STRAIN ML 308-225).

IN STRAIN ML 308-225).

IT (IN REF. 5).
                                                                                                                                                                                                                        STRAIN N
STRAIN N
MNLIYNA
TVNGGTLANHDNQIVFGTTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Usage
                                                                                                           Length 1039;
                                                                                                                                                                                                                          (IN
                                                                                       Indels
                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                             ML 308-225).
308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                У
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Escherichia
                                                                                                                                                                                                                          STRAIN ML 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                       204;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  coli
                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MAY
                                                                60
                                                                                       28
```

```
Š
                                                         Вb
                                                                                  Qy
                                                                                                               Вp
                                                                                                                                         ρy
                                                                                                                                                                       В
                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
 밁
                                                                                                                                                                                                                                                                                                                                                 177
                                                                                                                                                                                                                                                                                                                                                                                                         136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
 446
                            556
                                                         412
                                                                                     496
                                                                                                                352
                                                                                                                                            442
                                                                                                                                                                        324
                                                                                                                                                                                                     382
                                                                                                                                                                                                                                284
                                                                                                                                                                                                                                                           327
                                                                                                                                                                                                                                                                                        229
                                                                                                                                                                                                                                                                                                                    278
                                                                                                                                                                                                                                                                                                                                                                            228
                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                83
                                                                                                                                                                                                                                                                                      TANTTYVYAGGDQTVHGH---ALDTTLNGGYQYVHNGGTASDTV--VNSDGWQIVKNGGV
                                                                                                                                                                                                                                                                                                                                               --VKPGTVATDTV--VNTGAEGGPDAENGDTGQFVRGDAVRTTIN----KNGRQIVRAEG
                                                                                                                                                                                                                                                                                                                                                                            KGVKPGTTASDNVDFVRT-----
                                                                                                                                                                                                                                                                                                                                                                                                         AGG-GQSLQGRAVNTTLNGGEQWMHEGAIATGTVINDK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                MTISTGLEYGPDNE----ANTGGQWVQDGGTANKTTVTSG--GLQRVNPGGSVS-DTVIS 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVH
GTLAGTTTLNNGAILTLSGKTVNN
                                                                         VTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEA
: || : || : ||
                                                                                                                                                                                                   LNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDI
                                                                                                                                                                                                                                                                                                                    -AKTSVIKEKDGKLVTGKDKGENDSSTDKGEGLV----TAKEVIDAVNKAGWRM-----
                                                                                                                                                                                                                                                                                                                                                                                                                                    LNGIGSTL----TDTLLNTG-----ATTNVTNDNVTDDEKKRAASVKDVLNAGWNI 227
                           GYAIGYSSISDGGNWIIKGTASGN
                                                         ADALMLEKGSSFTLN---
                                                                                                                LTGHTATNTRVDDGGTLDVRNGGTATTVSMGNGGVLLADSGAAVSGTRSDGKAFSIGGGQ
                                                                                                                                          ATSMTPQFSSVSLGA-----GADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGD
                                                                                                                                                                        -GINRL-
                                                                                                                                                                                                                              AGNTTVN-QKGRL-QVDAGGTATNVTLKQGGALVTSTAATVT
                                                                                                                                                                                                                                                         -KTTTANGQTGQADKFETVTSGTNVTFASG----KGTTATVSKDDQGNITVMYDVNVGDA
   469
                            579
                                                          AGDTATDTT
                                                                                                                                                                                                                                                                                                                                                                            --YDTVEFLSADTKTTTVNVESKDNGKRTEVKIG
                                                                                                                                                                        GAFSVVEGKADNVV
                                                            -VNGGLFTARG 445
                                                                                                                                                                          - LENGGRLDV
                                                                                                                                                                                                                                                                                                                                                                                                          -GWQV
                                                                                                                                                                                                      441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                   411
                                                                                                                                                                          351
                                                                                                                                                                                                                                                              381
                                                                                                                                                                                                                                                                                                                                                                                                            176
                                                                                                                                                                                                                                   323
                                                                                                                                                                                                                                                                                                                       326
                                                                                                                                                                                                                                                                                                                                                    228
                                                                                                                                                                                                                                                                                           283
```

```
RESULT 2
OMPA_RICRI
OMPA_RICRI
P15921;
01-APR-1990
                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria; alpha subdivision; Rickettsiales; Rickettsiaceae; Rickettsieae; Rickettsia. NCBI_TaxID=783;
                                                  This SWISS-PROT entry is copyright. It is produced through a between the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict
                                                                                                                                                 Anderson B.E., McDonald G.A., Jones D.C., Regnery R.L.;
"A protective protein antigen of Rickettsia rickettsii has repeated, near-identical sequences.";
Infect. Immun. 58:2760-2769(1990).
-!- FUNCTION: ELICITS PROTECTIVE IMMUNITY.
-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVE
                                                                                                                                                                                                                                                                                                                                                                            Outer membrane
                                                                                                                                                                                                                                                                                                                                                                                      01-APR-1990 (Rel. 14,
01-APR-1990 (Rel. 14,
16-OCT-2001 (Rel. 40,
                                                                                                                                                                                                                                                 STRAIN-R
                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                  Rickettsia rickettsii
                                                                                                                                                                                                                                                                                                                                                OMPA
                                                                                                                                                                                                                                                                                                                                                             antigen) (rOmpA)
                                                                                                                          --
                                                                                                                                                                                                                                   MEDLINE=90354033; PubMed=2117568;
                                                                                                         SIMILARITY: BELONGS TO THE RICKETTSIAE
                                                                                                                        PTM: GLYCOSYLATED (PROBABLE).
                                                                                                                                       S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                            protein
                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                             (rOmp
                                                                                                                                                                                                                                                                                                                                                                                                     14,
                                                                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation update)
n A precursor (190 kDa antigen) (Cell surface p A).
                                                                                                                                                                                                                                                                                                                                                                                                                  Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                               2249
                                                                                                           OMPA/OMPB FAMILY
                                                                                                                                                       COVERED
                                                                                                                                                                                                            tandemly
                                                                     collaboration -
                                                                                                                                                       ВY
```

the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).

as its content is in

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                           망
                                                                                                                 δÃ
                                                                                                                                                              밁
                                                                                                                                                                                               20
                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                      당
                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뫄
                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
REPEAT
REPEAT
1170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
                                                                                                                                                              1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; M31227; AAA26380.1; PIR; A41477; A41477.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Antigen;
                                                                                                                                                                                                                                              1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro; IPR003858; rOmpA_rOmpB
                                     526
                                                                                                                                                                                                      423
                                                                                                                                                                                                                                                                                  363
                                                                                                                                                                                                                                                                                                                          964
                                                                                                                                                                                                                                                                                                                                                                  310
                                                                                                                                                                                                                                                                                                                                                                                                        905
                                                                                                                                                                                                                                                                                                                                                                                                                                                290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      854
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      752
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    640
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13 LNAWVAVSELTRN--HTKRASATVATAVLATLLFATVQASTTDDDDL-----YLEPVQRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity
NALATVNVGAGITLQA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAIDSTGNANNGIVTFTGNSTVTGDIG-----NTNALATVNVGAGTATL---GGAVIKAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AVVLSFRSDKEG----TGEKEVTEDSNWGVYFDKKGVLT----AGTITLKAGDNLKIKQN
                                   QAIAT ---- AGL-VQAYLPGKSMMA-----
                                                                                                                                                         NANNGIVTFTGNSTVTGNVGN-----TNALATVNVGAGLLQVQGGVVKANTINLTDNA
                                                                                                                                                                                                  NINAG----ANIEITRNGKNIDIATSMTPQFSSVSLGAG----ADAPTLSVDDEG
                                                                                                                                                                                                                                                                                SKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETV 422
                                                                                                                                                                                                                                                                                                                          GTATLGGAVIKATTTKLTDAASAVKFTNPVVVTGAIDNTGNANNGI-VTFTGNSTVTGNV
                                                                                                                                                                                                                                                                                                                                                                                                      LTNAASVLTLTNANAVLTGAIDNTTGGDNVGVLNLNGALSQVTG-DIGNTNSLATISVGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TGGDNVGVLNLNGALSQVTGDIGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKT----SVIKEKDGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TVHLNGIGSTLTDTLLNTGATTNVTNDNV---TDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTKLTNAASVL----TLTNANAVLTGAIDNTTGGDNVGV-----LNLNGALSQVTGD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LNLNGALSQVTGDIGNTNSLATISVGAGTATLGGAVIKATTTKITNAVSAVKFTNPVVVT
                                                                                                                   ALNYGSKDANKPYRITNYAPGYKEGDYTNYAQLKGYAQNLNNHIDNYDGNARA----GIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PF02708; rOmpA_rompB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Repeat; Signal; Cell wall;
                                                                                                                                                                                                                                          -GNTNALATVNVGAGL---LQVQGGVVKANTINLTDNASAVTFTNPVVVTGAIDNTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IGNTNSLATISVGAGTATLGGAVIKATTTKLTNAASVLTLTNANAVLTGAVDNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                              -AVTETN--PVVVTGAIDNTG---
                                                                                                                                                                                                                                                                                                                                                                KEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2249
11180
286
358
430
505
577
652
724
799
874
949
11021
11093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     224333 MW;
-GGSLAANNIDFGARSTLEFNGPLDGG-----GKAIPYYFK 1220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 224; DB 1;
Pred. No. 0.0011;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A (TY
B (TY
C (TY

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OUTER MEMBRANE PROTEIN A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13 X APPROXIMATE TANDEM REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----NSLAT-ISVGAGTATLGGAVIKATTTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (TYPE I).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A9D6646C089DF087 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S-layer; Glycoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (INCOMPLETE)
                                                                                                                                                                                                                                                                                                                                                                                                                             -----VTGKDKGENDSSTDKGEGL
                                                                              - NANNGIVTFTGNSTVTGDIGNT
                                     ----IGGGTYRGEAGYAIGY---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      256;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 2249;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        65
                                                                                                                                                                                                                                                                                                                          1022
                                                                           1169
                                                                                                                                                                                                  469
                                                                                                                                                                                                                                                                                                                                                                                                      963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    699
                                                                                                                                                                                                                                          1075
                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            177
                                     561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                34;
```

```
RESULT 3
AIDA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
             Š
                                            B
                                                                      2
                                                                                                  р
                                                                                                                            Š
                                                                                                                                                          밁
                                                                                                                                                                                   Qy
                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                        Query Match
Best Local 9
                                                                                                                                                                                                                                                                          Matches 146;
                                                                                                                                                                                                                                                                                                                                               PROPEP
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AIDA_ECOLI
Q03155;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                     PIR; S28634; S2
Cell adhesion;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          synthesized via a precursor molecule.";
Mol. Microbiol. 6:1539-1546(1992).
-i- FUNCTION: THIS IS AN ADHESION PROTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-JUN-1994 (Rel. 29, Created)
01-JUN-1994 (Rel. 29, Last sequence update)
01-JUN-1994 (Rel. 29, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1221 GAIANGNNAILNVNTKLLTASHLTIGTVAEINIGAGNLFTIDASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                               entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "AIDA-I, the adhesin involved in diffuse adherence of the diarrhoeagenic Escherichia coli strain 2787 (0126:H27), is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=92326638; PubMed=1625582;
Benz I., Schmidt M.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A., AND SEQUENCE STRAIN=2787 (0126:H27);
                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; X65022; CAA46156.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -!- SUBCELLULAR LOCATION: Outer membrane.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Plasmid pIB6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AIDA-I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Adhesin aidA-I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       562
                183
                                            167
                                                                       133
                                                                                                  108
                                                                                                                               112
                                                                                                                                                           61
                                                                                                                                                                                      52
                                                                                                                                                                                                                                   1 MNKIYRIIWNSALNAWVAVSELTRNH------TKRASATVATA--VLATLLFATVQAST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TO EPITHELIAL CELLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADHERENCE OF DIARRHEA-CAUSING
GIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF
                                                                                                                                                                                                                                                                                                                                                                                                                       S28634; S28634.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SSISDGGNWIIK----
                                           GGITDSTNISSGGQQRVSSGGVASNTTINS-----SGAQNILSEEGAISTHISSGGNQYI
                                                                                                  VGTSGATISTIVNSGGIQRVSSGGVASATNLSGGAQNI-YNLGHASNTVIFSGGNQTIFS
                                                                                                                                                           TVSSG-
                                                                                                                                                                                        TDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDN
                                                                                                                                                                                                                 MNKAYSIIWSHSRQAWIVASELARGHGFVLAKNTLLVLAVVSTIGNAFAVNISGTVSSGG
                                                                      ---KDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVHLN-----
                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                 1286
                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                        Signal; Outer membrane; Plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                               1286
AA; 132271
                                                                                                                                                           ETQIVYS----
                                                                                                                                                                                                                                                                                                                                                                                          49
                                                                                                                                                                                                                                                                                         20.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gamma subdivision;
                                                                                                                                                                                                                                                                          96;
                                                                                                                                                                                                                                                                                                                                               WW.
                                                                                                                             -KIKONTNENTNASSFTYSLK------
                                                                                                                                                                                                                                                                                        Score 219;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                           ADHESIN AIDA-I
                                                                                                                                                           -GRGNSNATVNSGGTQIVNNGGKTTATTVNSSGSQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -GTASGNSRGH---FGASASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                 B2A00F72AC05FB34 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PROTEIN NECESSARY FOR THE DIFFUSE ENTEROPATHOGENIC ESCHERICHIA COLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1286
                                                                                                                                                                                                                                                                                         .001;
                                                                                                                                                                                                                                                                                                     DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₿
                                                                                                                                                                                                                                                                         256;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                     Length 1286;
                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       591
                                                                                                                                                                                                                                                                          202;
                                                                                                                                                                                                                                                                          Gaps
                                            221
                                                                                                                                                                                        111
                                                                                                    166
                                                                                                                                                           107
                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                               51
                242
                                                                         182
                                                                                                                               1:32
```

30;

```
δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
YDEK_E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      멍
   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                MEDLINE-97251357; PubMed-9097039;
MEDLINE-97251357; PubMed-9097039;
Alba H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M.,
Kasai H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M.,
Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura
Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., S
Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J.,
Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.;
"A 570-kb DNA sequence of the Escherichia coli K-12 genome
corresponding to the 28.0-40.1 min region on the linkage map.
DNA Res. 3:363-377(1996).
SEQUENCE OF 595-1325 FROM N.A. MEDLINB-94100243; PubMed-8274505; Cartwright P.J., Timms M.W., Lithgow T., "An Escherichia coli gene showing a poter to the genes for the mitochondrial import
                                                                                                                                                                                                                                                                                                                             MEDLINE=97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burl
Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEK_ECOLI STANDARD: PRT; 13
932051: P76140; P77168;
01-CCT-1993 (Rel. 27, Created)
01-NOV-1997 (Rel. 35, Last sequence up
16-CCT-2001 (Rel. 40, Last annotation
Hypothetical lipoprotein ydek precurse
XDEK OR ORFT OR B1510.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ECOLI
                                                                                                                                                                                                                                                                                      Science
                                                                                                                                                                                                                                                                                                         "The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Escherichia coli.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                     Mau
                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            398
                                                                                                                                                                                                                                                                                                                     в.
,
                                                                                                                                                                                                                                                                                     complete genome sequence nce 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TAVWSMFPGTASGA-----NVNLSGRLNAFAGNVVGTILNQEGRQYVYSGATATSTVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TSMTPQFSSVSLGAGADAPTLSVDDEGALN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AVAGSSG--KVISGNVSPSKGKMDETVNINAGN---NIEITRNGKNI--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NIKGSQI------VNSEGTAINTLVSDGGYQHIRNGGIASGTIVNQSGYVNISSGGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TDKGEGLYTAKEVIDAVNKAGWRMKTTTANG----QTGQADKFETVTSGTNVTFASG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKGENDSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NNEGREYV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATVNTSGFQRINSGGTAPVQNSVVVTRTVSSAAKPFDAEVYSGGKQTVYLWRGIWYSNFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AESTIINSGGTLRVLSDGYARGTILNNSGRENVSNGGVSYNAMINTGGNQYIYSDGEATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NSGVQTV-FAGATVTDTTVN--SGGNQNISSGGIVSETTVNVSGTQNIYSG---GSALSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SAGANATETIVNSGGFQRVNSG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----KGTTATVSKDDQGNITVMYD---VNVGD-ALNVNQLQNSGWNL-
                                                                                                                                                                                                                                                                                                                     Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                          MG1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----LSGGITDGTVLNSGGLQAVSSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGTNIK--NGGTIRVDSGASALNIALSSGGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            equence update)
nnotation update)
K precursor (ORFT)
                                                                                                                                                                                                                                                                                                    of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    subdivision;
                                                                                                                                                                                                                                                                                                    Escherichia coli K-12.";
   a potential 
l import sit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -- AVATGTVLSGG -- TQNVSSGGSAISTSVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (ORFT)
                              Hoej
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
   site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----GKASATVINEGGAQFVY 595
j P.B., Hoog
l ancestral
te proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             569
                             Hoogenraad N.J
                                                                                                                                                                                                                                                                                                                                              Burland V. yhew G.F.,
   relationship
ISP42 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GIAQAIA
                                                                                                                                                                                                                                                                                                                                  D.J.,
                                                                                                                                                                  Saito
                                                                                                                                                                                  .×
                                                                                                                                                                                                            Itoh
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -DSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -DIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ŕ
                                                                                                                                                                                                                                                                                                                                                        ۷.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 375
                                                                                                                                                                  z
                                                                                                                                                                                                              .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      397
```

```
밁
                                                   ρy
                                                                              밁
                                                                                                  Qy
                                                                                                                            밁
                                                                                                                                                 ρ
                                                                                                                                                                          밁
                                                                                                                                                                                               Ş
                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Biochim.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EcoGene;
PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CHAIN
LIPID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; D90793; BAA15190.1;
EMBL; D90794; BAA15197.1;
EMBL; X73295; CAA51730.1;
PIR; S34315; S34315.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MOM38.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL;
            429
                                  334
                                                                                                     331
                                                                                                                            241
                                                                                                                                                   271
                                                                                                                                                                          211
                                                                                                                                                                                                   217
                                                                                                                                                                                                                         157
                                                                                                                                                                                                                                                 170
                                                                                                                                                                                                                                                                       104
                                                                                                                                                                                                                                                                                             115
                                                                                                                                                                                                                                                                                                                                                                                                                Local Si
hes 150;
                                                                                                                                                                                                                                                                                                                    48
                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                        ب
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (Potential).

SIMILARITY: TO E.COLI YFAL.
SIMILARITY: SOME, TO FUNGAL
ISP42 AND MOM38.

CAUTION: REF.3 SEQUENCE DIFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              European Bioinformatics Institute. The by non-profit institutions as long
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FRAMESHIFT IN POSITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SUBCELLULAR LOCATION: Attached
                                                                                                                                                                                                                                                                                                                                                                                     MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SWISS-PROT entry is
                                                                               LNVQ-
                                                                                                                             SIEFQIG-
                                                                                                                                               RTEVKIGAKTSVIKEKDGKLVTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTT
                                                                                                                                                                                                 VKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVES-----KDNGK
                                                                                                                                                                                                                          HVDGGYLRLGSSTGGVGTVNVEGEDSVLTTELFEIGSYGTGSLNIT-----
                                                                                                                                                                                                                                                                                KQNTNENTNASSFTYSLKKDLTDLTSV--GTEKLSFSANSNK-VNI-TSDTKGLNFAKK-
                                                                                                                                                                                                                                                                                                                                         PVQRTAVVLSFRSDKEGTGEKEVTEDS----NWGVYFDK--KGVLTAGTITLKAGDNLKI 114
                                                                                                                                                                                                                                                                                                                                                                 MNRIYRVIWNCTLQVFQACSELTRRAGKTSTVNLRKSSGLTTKFSRL-------
          --NIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV--
                                KGHWNFLGTGEAFRYIYIGDAGDGELNVSSEGKVDSGIITAG---MKET
                                                                                                     ANGOTGOADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALN--VNQLQ
                                                                                                                                                                           IVAIL-----GYQAGSNGQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AE000248; AAC74583.1;
                                                                                                                                                                                                                                                                                                                                                                                                              Similarity 23.:
50; Conservative
                                                                                                                                                                                                                                                                                                                    -TLGVLLALSGSASGASLEVDNDQITNIDTDVAYDAYLVGWYGTGVLNILAGGNASL 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EG11780; ydek.
PS00013; PROKAR_LIPOPROTEIN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Biophys.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           proteome.
                                                                               -DQDSVITVRRLYNGYFGNG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        884
1317
1325
                                                                                                                                                                                                                                                                       -TTTTTSVIGANEDSEGTVNVLGGTWRLYDSGNNARPLNVGQSGTGTLNIKQKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein; Membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Swiss Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          19
19
                                                                                                                                                                                                                                            -TAETNGDTTVHLNGIGSTLTDTLLNTGA----TTNVTNDNVTDDEKKRAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18
1325
19
884
1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Acta 1153:345-347(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                         7.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        136514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      copyright. It is produced through tute of Bioinformatics and the EN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ALT_INIT.
ALT_INIT.
ALT_FRAME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         653
                                                ·DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN----
                                                                                                                                                                                                                                                                                                                                                                                                                75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HYPOTHETICAL LIPOPROTEIN
N-ACYL DIGLYCERIDE (POTEN
N-> K (IN REF. 3).
M-> S (IN REF. 3).
MW; 26A3A066FA19AD7D CRC6
                                                                                                                                                                                                                                                                                                                                                                                                              Score 216.5;
Pred. No. 0.00
75; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DIFFERS
..
                                                                                                                             NQGTGEATIREG-GLVTAENTIIGGNATG----IGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Lipoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MITOCHONDRIAL
                                                                                TVNISNNGLINNKEYSLVGVQDGSHGVVNVTD
                                                                                                                                                                                                                                                                                                                                                                                                                         216.5;
No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ب
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                         ; DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     THAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                    1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SHOWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IMPORT
                                                                                                                                                                           -- VVVEKGGEWLIKNNDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ьy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            restricti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OL
                                   -GTGNITVK
                                                                                                                                                                                                                          -DKGYVTSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL outstation
            -GSKDANKP
                                                                                                                                                                                                                                                                                                                                                                                                                165;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a collaboration -
MBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             anchor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ions
                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                             169
                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                333
                                                                                                                                                                                                   270
                                                                                                                                                                                                                                                216
                                                                                                                                                                                                                                                                       156
                                                                                                                                                                                                                                                                                                                                                                  47
             481
                                                         428
                                                                                                                                                    330
                                                                                                                                                                           240
                                                                                                                                                                                                                         210
                                   387
                                                                                                                             278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                28;
```

```
RESULT 5
HLYA_PROMI 1
ID YALVA_P PROMI 1
AC P16466
DT 01-AUG
DT 01-AUG
DT 01-AUG
DT 01-AUG
DT 01-NO
DE Bactes
OC Protes
OC Protes
OC STRAI
RX SEQUES
RX MEDLL1
RX MEDL
Š
                                                      Вb
                                                                                                     ρ
                                                                                                                                                                    Вþ
                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "Nucleotide sequencing of the Proteus mirabilis calcium-independent hemolysin genes (hpmA and hpmB) reveals sequence similarity with the Serratia marcescens hemolysin genes (shlA and shlB).";
J. Bacteriol. 172:1206-1216(1990).
-I- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P16466;
01-AUG-1990 (Rel. 15, Created)
01-AUG-1990 (Rel. 15, Last sequence update)
01-NOV-1990 (Rel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -i- SUBCELLULAR LOCATION: Outer membrane.
-i- MISCELLANEOUS: THE CONSERVED AMPHIPATHIC DOMAINS
-MAY BE RESPONSIBLE FOR PORE FORMATION.
-i- SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A., AND SEQUENCE STRAIN=ISOLATE 477-12; MEDLINE=90170827; PubMed=2407716;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PIR; A35140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; M30186; AAA25657.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Uphoff T.S., Welch R.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Proteus mirabilis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HLYA_PROMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=584;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Proteus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hemolysis;
                                                                                                                                                                    317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          388
                                                         365
                                                                                                          82
                                                                                                                                                                                              22 LTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLEPVQRTAVVLSFRSDKEGTGEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DEFINED. FUNCTION: CELL-BOUND HEMOLYSIN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REQUIRES HPMB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ERYTHROCYTES BY INTERACTION WITH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSGIVNVSNGATLNSTGYGFIGGNASGKGIVNISTDSLWNLK-TSSTNAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VYTTIGVAGVGNLNISDGG--KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DKNSVITNLGTNLGYDGHGEMNISNQGLVVSNGGSSLGYGETGVGNVSITTGGMWEVNKN
                                                   ETDIDNRWFYSWKYDVTKEKEQIQQIGSQIDAKNNATLTATKGDVTLDAAKINAGNNLAI
                                                                                                             EVTEDSNW---
                                                                                                                                                                    LTKTELKGKNIT - - - -
                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                       30
1577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Toxin; Outer membrane; Signal.
                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A35140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 1577
KQNTNENTNASSFTYSLKK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AND SEQUENCE OF
                                                                                                                                                                                                                                                                                                      6.8%;
22.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                          165869
                                                                                                                                                                 ·LVASSHNQIKASDLMGDDITLQGADLTI-----
                                                                                                                                                                                                                                                                            76;
                                                                                                                                                                                                                                                                                                                                                                                                                       MW;
                                                                                                                                                                                                                                                                         Score 204.5; DB 1;
Pred. No. 0.0066;
6; Mismatches 257;
                                                                                                                                                                                                                                                                                                                                                                                                                 HEMOLYSIN.
W; 175975E0C924B2D9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                          GVYFDKKG----VLTAGTITL----KAGDNLKI 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WHICH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   30-43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FRYTHROCYTE MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A
  --DLTDLT--
                                                                                                                                                                                                                                                                                                                                                                                                                    CRC64;
                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                             Length 1577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEMBRANE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SHLA AND HPMA
                                                                                                                                                           -DGKQLQQK 364
                                                                                                                                                                                                                                                                            177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FROM
                                                                                                                                                                                                                                                                      Gaps
                                                      424
                                                                                                                                                                                                                     81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    447
                                                                                                                                                                                                                                                                            30;
```

```
RESULT 6
HLYA_SERMA
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                              POOLE K., Schiebel E., Braun V.;
"Molecular characterization of the hemolysin determinant marcescens.";
                                                                                                                                                                                        J. Bacteriol. 170:3177-3188(1988).
-!- FUNCTION: BACTERIAL HEMOLYSINS ARE EXC
CELL MEMBRANES AND CAUSE CELL RUPTURE
                                                                                                                                                                                                                                                                                                                                                                                                                   01-APR-1990
01-NOV-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                            P15320;
01-APR-1990
                                                               This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EM
                                                                                                                                                                                                                                                                            MEDLINE=88257037; PubMed=3290200;
                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                               Serratia
                                                                                                                                                                                                                                                                                                                                                           Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                           Serratia marcescens
                                                                                                                                                                                                                                                                                                                                                                                                   Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HLYA_SERMA
                                                                                                                                                                 <del>-</del>
                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          890 TTKPG-NNTDLTKKVTARDAIANLANLSNLETPNVGVEVGIKGGGSQQSQTDSQAVSTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     486 NVAPGVKEGDVTNVAQLKGVAQNLNN--HIDNVDGNARAGI------AQAIATA 531
                                                                                                      REQUIRES SHLB FUNCTION.
SUBCELLULAR LOCATION: Outer membrane.
SIMILARITY: TO P.MIRABILIS HEMOLYSIN (HPMA).
                                                                                                                                                                FUNCTION: CELL-BOUND HEMOLYSIN,
                                                                                                                                                   ERYTHROCYTES BY INTERACTION
                                                                                                                                                                               DEFINED.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSITAQGAKLHANENVLVNAKDNINLNVQK----TNNDKTVTDNHVMWGGIGGGQNKNNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN-GKNIDIATSMTPQFSSVSLGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKG-----VKPGTTASDNVDFVRTYDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ASHHVEGRYQESGENIQHLAVNDSETSKTDSLNVGIDVGVNLDYSGVTKPVKKAIEDGVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SGGFS---YTGGVDKVGSKADFQYD-KQHTQTEVTKNRGSQTEVAGDLTITANKDLLHEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ANSTISGANVDLQANKDVTFAGSDLKTTAGNASITGD-NVAFVSTENKKQTD--NTDTTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FETVTSGTNVTFASGKGTTATVS--KDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GIHSLGDINVKSAQQVTKIDDEKTSLAITGHAKEVEDKQYSAGFHITHTTNKNTSTETEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ENDSSTD---KGEGLVT------AKEVIDAVNKAGWRMKTTTANGQTGQADK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ISKIDERTGTAFNITKSSHKNETNKQTSTGSELISDAQLTVVSGNDVNVIGSLIKSADKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VEFLSAD-----TKTTTVNVESKDNGKRTEVKIGAKTSVIKEKD----GKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NQQQVSHAT - - QLTADGQLLLAADNNVNITGSQVKGNQGAFVK - - TTQGDVVIDNALSET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -SVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVHLN-----GIGSTLTDTLL
                                                                                                                                                                                                                                                                                                                                                                                                               (Rel. 14, Created)
(Rel. 14, Last sequence up
(Rel. 16, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -DAPTLSVDDE-----GALNVG-----SKDANKPVR-----IT
                                                                                                                                                                                                                                                                                                       AND SEQUENCE
                                                                                                                                                                                                                                                                                                                                                           gamma
                                                                                                                                                                                                                                                                                                                                                                                                                               sequence update)
                                                                                                                                                   HTIW
                                                                                                                                                                                                                                                                                                                                                           subdivision;
                                                                                                                                                                                                                                                                                                       ΟĘ
                                                                                                                                                                WHICH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1608
                                                                                                                                                    THE
                                                                                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                           EXOTOXINS THAT ATTACK
JRE BY MECHANISMS NOT (
                                                                                                                                                    ERYTHROCYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                 RELEASES
                                                                                                                                                                                                                                                                                                                                                            Enterobacteriaceae;
                                                                                                                                                                                                                                                  of Serratia
                                                                     a collaboration -
                                                                                                                                                                                           CLEARLY
                                                                                                                                                                 FROM
                                                                                                                                                                                                           BLOOD
                                                                                                                                                    SHLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        829
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           248
```

entities or send a

the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for con

EMBL outstation

commercial

requires a license agreement (See http://www.isb-sib.ch/announce/ an email to license@isb-sib.ch).

```
RESULT
YDBA_EC
    OC CC
                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SO SO
                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                   TDBA_ECOLI STANDARD; PRT; 2003 AA. p33666; P76087; P76088; P76856; P76857; P76859; 01-FEB-1994 (Rel. 28, Created) 16-OCT-2001 (Rel. 40, Last sequence update) 16-OCT-2001 (Rel. 40, Last annotation update) Hypothetical protein ydba.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL;
PIR; /
                                                                                                                           ECOLI
                                                                                                                                                                               1048
               Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hemolysis; Toxin;
                             YDBA OR B1401/B1405.
                                                                                                                                                                                                         571
                                                                                                                                                                                                                                  988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           525
                                                                                                                                                                                                                                                                                      929
                                                                                                                                                                                                                                                                                                                 478
                                                                                                                                                                                                                                                                                                                                            881
                                                                                                                                                                                                                                                                                                                                                                   425
                                                                                                                                                                                                                                                                                                                                                                                               825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                471
                                                                                                                                                                                                                                                                                                                                                                                                                         365
                                                                                                                                                                                                                                                                                                                                                                                                                                                  769
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; M22618; AAA50323.1;
A28182; A28182.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WSNSDESESLKASELRSEGELTLKAGRNVSTQ-----GAKVHAQRDLTIDADNQIQVGV
                                                                                                                                                                               KDAIYQGTALNGGRGKTAVNA 1068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      W-NSALNAWVAVSELTRNH--TKRASATVATAVLATLLFATVQAS---TTDDDDLYLEPV 62
                                                                                                                                                                                                                                                            GIAQAIATAGL---VQAYLPGKSMMAIG----GGTYRGEAGYAIGYSSISDGGNW-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QKTANAKAVRDDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLKIKQNTNENT
                                                                                                                                                                                                                                 QDEQSRDTRGSAGVRVYTTTGSDLTVDAKGEGGTQRSNSSASQAVTGSIDAANGINVNVK 1047
                                                                                                                                                                                                                                                                                     GSSEKRSSSSQAVVSSVQAGSIDINAKGEVRDQGTQYQASKG:
                                                                                                                                                                                                                                                                                                                                                                   NAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEG-----ALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                              DVKGNLT----INARDKLTQQGAQHSVGGAYQENAAGVDHLAAADTASTTTTKTDVGVNI
                                                                                                                                                                                                                                                                                                                                                                                                                       DDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                SFLAADDKTASNTEQTKIGGGFYYTGGIDK---LGSGVEAGYENNK-TQAQSSKAITSGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                --IDAVNKAGWRMKTTTANG---QTGQADKFETVTSGTNVTFASGKGTTATVSK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YRAGLRIEHTRDSEKTTRTENSASSLSGGSVKLKAEKDVTFSGSKLVADKGDASVSGNKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KRTEVKI-----GAKTSVIKEKDGKLVTG--KDKGENDSS-----TDKGEGLVTAKEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LVSHKDADVIGSQVASGGELSVESKTGNINVKAAERQQNIDEQKTALTVNGYAKEAGDKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NALSTTVDKIDARTGTAFNITSSSHKADNSYQSSTASEL------KSDTNLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNIT-SDTKGLNFAKKTAETNGDTTVHL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                        IIKGTASGNSRGHFGASA
 Proteobacteria;
               coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA;
                                                                                                                                                                                                                                                                                                                                          -GANVDYSAVTRPVERAVGKAAKLDA-TGVINDIGGIGAPNVGLDIGAQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ------LSADTKTTTVNV------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Outer membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ·ELTSGGTLRLN---GQQGVTITGSKARGQKGGEVTA-THGGLRID-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6.7%;
22.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    165078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----TSWG------GIGGGDN-KNNSNRREIS
gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 203; DB : Pred. No. 0.008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HEMOLYSIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
 subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 D669B476FE7DAD51 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Signal
                                                                                                                                                                                                                                                                                                               -TNVAQLKGVAQNLNNHIDNVDGNARA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 259;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1608;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels 184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ESKDNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                   477
                                                                                                                                                                                                                                                                                                                                                                                              880
                                                                                                                                                                                                                                                                                                                                                                                                                         424
                                                                                                                                                                                                                                                                                                                                                                                                                                                  824
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                            570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 33;
```

•

```
Ъ
                                                                                 Ωy
                                                                                                                       В
                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                 Query Match
Best Local (
                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                     Ecogene; EG11307; yaux.

Ecogene; EG11307; yaux.

Hypothetical protein; Complete proteome.

Hypothetical protein; Complete proteome.

CONFLICT 489 489 I -> V (IN REF. 2).

CONFLICT 495 495 I -> V (IN REF. 2).

CONFLICT 495 495 WW; B83A12C8B53220EE
                                                                                                                                                                                                                                                                                                                                                                                                     EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=97251357; PubMed=9097039;
Aiba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Kasai H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M., Kasai H., Miki T., Mizouchi K., Mori H., Mori T., Motomura Makino K., Miki T., Mizouchi K., Mori H., Mori T., Oshima T., Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.; Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.; Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.; Takemoto DNA sequence of the Escherichia coli K.12 genome corresponding to the 28.0-40.1 min region on the linkage map. DNA Res. 3:363-377(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-K12 / MG1655;
MEDLINB-97426617; PubMed-9278503;
MEDLINB-97426617; PubMed-9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F. Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             [3]
                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Escherichia coli K-12.";
Biochimie 73:1361-1374(1991)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Moszer I., Glaser P., Danchin
Multiple IS insertion sequent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=92190338;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-K1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-KI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "The
                  121
                                                    131
                                                                                     74
                                                                                                                       73
                                                                                                                                                                                                                                                                                                                                                   L; AE000237; AAC74483.1; AIT_SEQ.
L; AE000237; AAC74487.1; AIT_SEQ.
L; D90778; BAA15090.1; ALT_SEQ.
L; D90778; BAA18880.1; ALT_SEQ.
L; D90779; BAA18881.1; ALT_SEQ.
L; AC5860; -; NOT_ANNOTATED_CDS.
Sene; EG11307; ydba.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIMILARITY: TO S.TYPHIMÜRIUM ORF NEAR CYSG CAUTION: THIS IS A CONCEPTUAL TRANSLATION; THIS PROTEIN IS INTERRIPTED BY A HYBRID IS2 BETWEEN AMINO ACIDS 839 AND 840.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complete genome sequence of Escherichia coli K-12.";
nce 277:1453-1474(1997).
                                                                                                                                                        ATVATAVLATLLFATVQASTTDD------
                NTNASSFTYSLKKDLTDLTSYGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTT-V 179
                                                                                 DKEGTGEKEVTEDSNWGVYFDK-KGVLTA-
                                                    DDTPTPPKPVSFNND--VILDKTEKTLTIRDSVFTYTENADGTISLQDSNGRKATINLWQ
                                                                                                                       STGAAALITAL--AVVELNDDDDHHHRNNSPLPPTPPDDESDDTPVPPTPGGDEIIPDDP 130
                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OF 464-2003 FROM N.A.
                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PubMed=1665988;
                                                                                                                                                                                                            6.6%;
::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sequences
                                                                                                                                                                                            74; Mismatches
                                                                                                                                                                                                            Score 198;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A . ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        near
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the replication terminus
                                                                                                                                                          -----DDLYLEPVQRTAVVLSFRS
                                                                                                                                                                                                            DB 1
                                                                                                                                                                                                                             1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IS2D/IS30C
                                                                                   GTITLKAGDNLKIKQNTNE 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   THE
                                                                                                                                                                                                                             Length
                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                   CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P25928).
GENE CODING
                                                                                                                                                                                                                               2003;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ELEMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              map.";
                                                                                                                                                                                              158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Saito
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Itoh T.,
                                                                                                                                                                                          Gaps
                                                                                                                                                          73
                                                      188
                                                                                                                                                                                              35;
```

ð 밁 Ş

Db

멍

```
OMPB_RICRI
Q53047;
30-MAY-2000
30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
10-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rompB)
(romp B) (Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide
                                                                                                                                                                                                                                                              MEDLINE-92167802; PubMed-1724278; Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstadt T.; "The 120 kilodalton outer membrane protein (rOmp B) of Rickettsia rickettsii is encoded by an unusually long open reading frame: evidence for protein processing from a large precursor.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RICRI
                       ---
                                                                                                                                                                                                                                                                                                                                                                  STRAIN=R
                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Proteobacteria; alpha subdivision; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OMPB
                                                                                                                                                   Gilmore R.D. Jr.,
                                                                                                                                                                                                             SEQUENCE OF 279-1654 FROM N.A.
                                                                                                                                                                                                                                                    Mol.
                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID-783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rickettsia rickettsii.
                                                                                                                                                                   MEDLINE=90136087; PubMed=2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    189
                                                                                                                                    loning,
             more R.D. Jr., Joste N., McDonald G.A.;
oning, expression and sequence analysis of the gene encodir
) kD surface-exposed protein of Rickettsia rickettsii.";
Microbiol. 3:1579-1586(1989).
Microbiol. 3:1579-1586(1989).
MICROBION: THE 120 kDa SURFACE-EXPOSED PROTEIN IS A MAJOR
STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL
VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.
SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED
                                                                                                                                                                                                                                                Microbiol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GIQIDGDQAIVNNEGEST --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNH-I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VAGSSGKVI-SGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMT---PQFSSVSL:||::|| :| :| |: |: |:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK---RTEVKIGAKTSVIKEKDGKL-V
:: ; | | ; | | ; : | | | ; | | |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GDIVVSDTGSIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTASGNSRGHFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTVDGKDSTG-TKIAGNIGIVN--LDG-SLTVTGG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IAGNNGKVIQDGDLDVSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SGGGHGIDITGDSATVDNKGTMTVTDPESIGIQVDGDQAVVNNEG---ESAITNGGTG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TGKDKG---ENDSST--DKGEGLVTAKEVID-----AVNKAGWRMKTTTANGQTGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NNEGESTITNGGTGTQINGDDATANNNGKTTVDGKDSTGTEIN-GNNGKVI--QDGDLDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EINGNNGKVIQDGDLDVSGGGHGIDITGDSATVD-NKGTMTVTDPESMGIQIDGDK-AIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HLNG-IGSTLTDTLLNT---GATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IDEANN-TVALE----GVSADGATKWQYNHNGELV-ITGDNATVNNNGKTTVDGKDSTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TQINGDDAT-ANNNGKTTVDGKDSTGT
                                                                                                                                                                                                                                              protein processing frol. 5:2361-2370(1991).
   HEXAGONAL SYMMETRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----ITNGGTG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -GHGIDITGDSATVDNKGTMTVTDPE----SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsiales,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----TQINGNDATANNSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -AHGVENIGDNGTVNNK
                                                                                                                      encoding
                     COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----E
                   ВY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  485
                   Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
```

δÃ 밁 Qy В Ş 밁 Qγ 밁 δÃ B Š

```
Ş
                          멍
                                                     Q
                                                                                   В
                                                                                                         Q
                                                                                                                                         В
                                                                                                                                                                   Qy
                                                                                                                                                                                                  В
                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the European Bioinformatics Institute. There are no rest
use by non-profit institutions as long as its content
modified and this statement is not removed. Usage by an
entities requires a license agreement (See http://www.isb-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Antigen; S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; X16353; CAA34403.1;
  543
                                                                                                                451
                                                                                                                                                                                                                                364
                                                                                                                                                                                                                                                            423
                                                                                                                                                                                                                                                                                                                                                                          307
                                                                                                                                                                                                                                                                                                                                                                                                                                  251
                                                                                                                                                                                                                                                                                                                                                                                                                                                              196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            134
                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          30 ASATVATAVLATLLFATVQ------ASTTDDDDLYLEPVQRTAVVLSFRSDKEGTGEKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation
                            QFAHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAAGTNLGSATNPLAEINFGSKGVNVDT
                                                                                                                                                                                                                                                                                                                                                                                                                                  ANTLNLQAGGTTINFTGTDGTGRLVLLSKHAAATNFNITGSLGGNLKGVIEFNTVA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TLT-ITGQGVTNAQAAATKNAQNVVVQFNNGAAIDNNDLKGVGRIDFGAPASTLVFNLAN 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DLTDLTSVGTEKLSFSANSNKVNI------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTEDSNWGVYFDK-----KGVL--TAGTITLKAGDNLKIKQNTNENTNASSFTYSLK--K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STATIVASFAGSAMGAAIQQNRTTNGAATTVDGAGFDQTAAPANVGVALNA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PF02708; rOmpA_rOmpB; 1.
 MMAIGGGTYRGEAGYA-----
                                                                                                                SVSLGAGADAPTLSVDDE-
                                                                                                                                                                                                                             KDDQGNITVMYDVNVGDALN--VNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM---
                                                                                                                                                                                                                                                            GDASNPGNTAG---VITFDANGTLESASADANVAVTNNITAIEASGAGVVQLSGTHAAELR
                                                                                                                                                                                                                                                                                                                                            ---RTEVKIGAK-TSVIKEKDGKLVTGKDKGENDSSTDKGEGLVTAKEVIDAV-----
                                                                                                                                                                                                                                                                                                                                                                                                    FVRTYDTVEFLSADTKTTTVN-----VESKDNGK------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PTTQKAPLILGDNAVIANGVNGTLNVTNGFIQVSNKSFATVKAINIADGQGIIFNTDANN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KTAETN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ITANANNGINFNTPAGSFNGLLLNTANNLAVTVSEDTTLGFITNVVHNAHSFNLTLNAGK
                                                                                    VVDASSLTNAQTLTINGKIGTIGANNKTLGQFNIGSSKTVLSNGNVAINELVIG-NDGAV
                                                                                                                                            RITLANDAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTSTQNNIVVDFDLAIA-TDQTG
                                                                                                                                                                                                   LGNAGSIFKLAD---GTVINGKVNQTALVGGALAAGTITLDGSATITGDIGNAGGAAALQ
                                                                                                                                                                                                                                                                                                                VNFRHIVDVGADGTTAFKTAASKVTITOD--SNFGNTDFG-NLAAQIKVPNAITLTGNFT
                                                                                                                                                                                                                                                                                                                                                                          VDGQLTANAGAANAVIGTNNGAGRAAGFVVSVDNGKVATIDGQVYAKDMVIQSANATGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       s requires a license agreement (See http://www.isb-sib.ch/announce/an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1334
1181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1654
                                                                                                                                                                                                                                                                                     -NKAGWRMKTTTANG--QTGQADKFETVTSGTNVTFASGKGT----TATVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                             GATTNVTNDNVTDD----
                                                        TNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPGK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -GDTTVHLNGIGSTLTDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cell wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             168184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ₹
.
                                                                                                                                                                      -DETVNINA-GNNIEITRNGKNI----DIATSMTPQFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120 KDA S
32 KDA BI
POLY-THR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 195; DB Pred. No. 0.02; 3; Mismatches
  --IGYSSISDGGNWIIKGTASGNSRGHFGASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                             EKKRAASVKDVLNA-GWNIKGVKPGTTASDNVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KDA BETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             D7AB70FB7087F618 CRC64;
                                                                                                               -GALNVGSKD---ANKPVRITNVAPGVKEGDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SURFACE-EXPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -TSDTKGL-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       273;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 1654;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -LLNT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       244;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ---NFAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for
    588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ł
                                                         ŝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    133
                                                                                       655
                                                                                                                                                                         450
                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                             319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             82
                                                         542
                                                                                                                  496
                                                                                                                                            596
                                                                                                                                                                                                     537
                                                                                                                                                                                                                                418
                                                                                                                                                                                                                                                                                        363
                                                                                                                                                                                                                                                                                                                   422
                                                                                                                                                                                                                                                                                                                                                                          365
                                                                                                                                                                                                                                                                                                                                                                                                      270
                                                                                                                                                                                                                                                                                                                                                                                                                                  306
                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       36;
```

```
RESULT 9
BIGA_SALTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
   EMBL; AF133696; AAD39458.1;
EMBL; AE008859; AAL22340.1;
EMBL; M64606; AAA27042.1; ALT
EMBL; M64606; AAA27043.1; ALT
EMBL; M64606; AAA27043.1; ALT
EMBL; G39200; C39200.
PIR; D39200; D39200
StyGene; SG10437; bigA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SALTY
STANDARD; PRT; 1900 An.
BIGA_SALTY STANDARD; PRT; 1900 An.
P25927; P25928; Q9XCQ3;
01-MAY-1992 (Rel. 22, Created)
01-MAR-2002 (Rel. 41, Last sequence update)
01-MAR-2002 (Rel. 41, Last annotation update)
01-MAR-2002 (Rel. 41, Last annotation update)
 DOMAIN
REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                           This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-LT2 / SGSC1412 / ATCC 700720;

MEDLINE-21534948; PubMed-11677609;

MCClelland M., Sanderson K.E., Spieth J., Clifton S.W.,

Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou

Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., M

Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nha

Waterston R., Wilson R.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-14028;
Stojiljkovic I., Valentine P., Heffron F.;
"Salmonella typhimurium rhs homolog.";
Submitted (MAR-1999) to the EMBL/GenBank/DDBJ
[2]
                                                                                                                                                                                                                                                                                                                                              J. Bacteriol. 173:325-333(1991)
-!- CAUTION: Ref.3 sequence dif
                                                                                                                                                                                                                                                                                                                                                                               MEDLINE-91100301; PubMed-1987123; Wu J.Y., Siegel L.M., Kredich N.M.; "High-level expression of Escherichia requirement for a cloned cysG plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Putative surface-exposed BIGA OR STM3478.
                                                                                                                                                                                                                                   or send an
                                                                                                                                                                                                                                                          use by non modified and
                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-LT2
                                                                                                  CHAIN
                                                                                                              SIGNAL
                                                                                                                          Virulence;
                                                                                                                                                                                                                                                 entities requires a
                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nature 413:852-856(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Complete genome sequence of Salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=602;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                           716
                                                                                                                                                                                                                                                                                   European
                                                                                                                                                                                                                                                       SWISS-PROT entry is copyright. It is produced through a collaboratic een the Swiss Institute of Bioinformatics and the EMBL outstation European Bioinformatics Institute. There are no restrictions on it by non-profit institutions as long as its content is in no was field and this statement is not removed. Usage by and for commercial field and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VLNVGEGVNL---
                                                                                                                                                                                                                                                                                                                               positions 414 and 732.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FROM N.A
                                                                                                                                                                                                                        equires a license agreement (See http://www.isb-sib.ch/announce/email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                typhimurium
                                                                                                                        Repeat;
   101
101
104
114
123
134
                                                                                                                                                                                                                                                                                                                                                                                                                                              1-765
                                                                                                                                                                                                                                                                                                                                                                                                                                              FROM N.A.
                                                                                                  1953
                                                                                                            Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            - YATNITTTDANVGSFVFNAGGTNIVSGTVGGQQGNKFNTVA
  252
103
113
122
133
144
155
                                                                                                                                                                      ALT_FRAME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gamma
                                                                                                          Complete proteome POTENTIAL.
PROTEIN BIGA.

15 X 11 AA TANDEM F

1 (INCOMPLETE).

2 (INCOMPLETE).

3 (INCOMPLETE).

6.
                                                                                                                                                                                                                                                                                                                                             differs
                                                                                               PUTATIVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                             from
                                                                                                SURFACE-EXPOSED
                                                                                                                                                                                                                                                                                                                                                                              coli NADPH-sulfite reductase: to overcome limiting siroheme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            enterica serovar Typhimurium
                                                                                                                                                                                                                                                                                                                                             that
                                                                                                                                                                                                                                                                                                                                             shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   databases
                                                                         REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     precursor
                                                                                                                                                                                                                                                                                                                                             due
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nhan
                                                                                                  VIRULENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mulvaney
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Latreille P
                                                                                                                                                                                                                                                                                                                                              ç
                                                                                                                                                                                                                                                    is
for
                                                                                                                                                                                                                                                                                                                                                                                 siroheme
                                                                                                                                                                                                                                                                                               collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ξ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           пР.,
                                                                                                                                                                                                                                                            way
cial
```

B B B B B

SLAP\_CAMFE P35827; 01-JUN-1994 01-JUN-1994 01-OCT-1994

(Rel. (Rel. (Rel.

29, 30,

Created) Last seq Last ann

sequence up annotation

update)

STANDARD;

A

RESULT 10 SLAP\_CAMFE

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                  γo
             δÃ
                                       Дb
                                                          δÃ
                                                                                 В
                                                                                                  Qy
                                                                                                                          밁
                                                                                                                                             Qy
                                                                                                                                                                   밁
                                                                                                                                                                                     Qy
                                                                                                                                                                                                           멍
                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Sim
Matches 141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
REPEAT
                    553
                                                                                 742
                                                                                                      453
                                                                                                                           682
                                                                                                                                                                   626
                                                                                                                                                                                                            584
                                                                                                                                                                                                                                                     542
                                                                                                                                                                                                                                                                                                                                        459
                                                                                                                                                                                                                                                                                                                                                                                                                         347
850
                                        791
                                                                                                                                               407
                                                                                                                                                                                         353
                                                                                                                                                                                                                                 294
                                                                                                                                                                                                                                                                                               494
                                                                                                                                                                                                                                                                                                                    188
                                                                                                                                                                                                                                                                                                                                                            128
                                                                                                                                                                                                                                                                                                                                                                                 406
                                                                                                                                                                                                                                                                                                                                                                                                   86
                                                                                                                                                                                                                                                                                                                                                                                                                                    41 TLLFATVQASTTDDDDLYLEPVQRTAVVLS-FRSDKEGTGEKEVTE----
                                                                                                                                                                                                                                                                  TA-SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                 TISGHSTVDNATGALISGNGTTTNFAGDIAVSGGGTAIIIDGDNATIK----
ENKGDITSHGVYSVIRADNGSEVSNSGDILVYATSSNSSEDRAAITRASG
                  GEAG-----YAI----GYSSISDGGNWIIKGTASGNSRGHFGASASVG
                                                                                 GLSVTGDDNDVEID--GGINI--THSEDPLDGTS
                                                                                                      SLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNH
                                                                                                                           DITGNVNISADYGODDLAAGAPPLTGVVVGGNGNTVTLNGALNIDDNDLSATGGQYLDVV
                                                                                                                                                                              -----ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV
                                                                                                                                                                                                                                                      RIDGDDAHTTNTGD----IAVDGAGSAAVIINGDNGSLTQA------GDLLV-
                                                                                                                                                                                                                                                                                                                                                           TYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAETNGDTTVHLNGIGST
                                                                                                                                                                                                                                                                                                                                                                                                                        TVISGDDQAHNS-DRGMDISGQDRTGVIISGDRTVNTLTGDSSVTDGATGMVISGDGTTN
                                       -STIDTNTVVGGHVVLARVNNGGSLILGDDSVVDVNVSYIPTGYYTYNALLMADGEGTSI
                                                            IDNVDGNARAG----IAQAIATAGLV-----
                                                                                                                                             -ISGNVSPS------KGKMDETVNINAGNNIEITRNGK-NI---DIATSMTPQFSSV
                                                                                                                                                                   NKGDIDVSLNGTGALVS-GDMSQVTLDGDINV---VSVQDSEGVFSSATGVSVSGDSNAV
                                                                                                                                                                                                                                KDKGENDSSTDKGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF-
                                                                                                                                                                                                                                                                                               ITGDNVVIDNAGSTTVSGADATALYIEGDNAL---
                                                                                                                                                                                                                                                                                                                    LT-DTLL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                156
167
178
189
200
221
222
233
244
207
514
1698
1795
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                   DSNWGVYFDKKGVLT------AGTITLKAGDNLKIKQNTNENTNASSF 127
                                                                                                                                                                                                            -TDGAMGIITYGTGNEAKN-----TGNATVRDADSVGFVVAGEKNTFK
                                                                                                                                                                                                                                                                                                           NTGATT------NVTNDNVTDDEKKRAASVKDVLNAG-WNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                        DISGAGSTGTVIDGNNARVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6.5%;
21.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       200150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                81; Score 195; DB
81; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QYLE -> ITLQ (IN REF. SA -> T (IN REF. 1).
MW; 611B3F1C954D91AE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10.
11.
12.
13.
14.
15 (I
D ->
D ->
D ->
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15 (INCOMPLETE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DRGDDDVTPPDD (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (IN REF.
                                                                                 -----ADITGISVSGNSTVTLNGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 1
                                                            -QAYLP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 232;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1;
                                                                                                                                                                                                                                                                                                                                        ---NDGDMTITDGGTGGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                               -VINEGNQTISGGAVGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REF.
                                                            -GKSMMAIGGGTYR
 899
                    591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -NTGTS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                        406
                                                                                                                                                                                                                                                                                                                                                            187
                                                                                                      512
                                                                                                                           741
                                                                                                                                                452
                                                                                                                                                                    681
                                                                                                                                                                                                              625
                                                                                                                                                                                                                                 352
                                                                                                                                                                                                                                                     583
                                                                                                                                                                                                                                                                          293
                                                                                                                                                                                                                                                                                               541
                                                                                                                                                                                                                                                                                                                   234
                                                                                                                                                                                                                                                                                                                                        493
                                                                                                                                                                                                                                                                                                                                                                                                                                             85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   33;
```

```
δõ
                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                              δ
                                                                                                                                                            В
                                                                                                                                                                                   Qy
                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                   8
 B
                      δÃ
                                                   망
                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Blaser M.J., Gotschlich E.C.;
J. Biol. Chem. 265:19372-19372(1990).
-I- FUNCTION: THE S-LAYER IS A PARACRYSTALLINE MONO-LAYERED ASSEMBLY
OF PROTEINS WHICH COAT THE SURFACE OF BACTERIA. THIS PROTEIN IS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the European Bioinformatics Institute. There are no rest
use by non-profit institutions as long as its content
modified and this statement is not removed. Usage by ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; J05577; AAA23032.1; Cell wall; S-layer.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ERRATUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              structure.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Blaser M.J., Gotschlich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=90354448; PubMed=2387868;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-84-32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Campylobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Campylobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S-layer protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=91035477; PubMed=2229082;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Surface array protein
 588
                                                                                                                                                                                                                                                                                                                        306
                          368
                                                   540
                                                                             310
                                                                                                         505
                                                                                                                                  250
                                                                                                                                                              457
                                                                                                                                                                                       205
                                                                                                                                                                                                                 402
                                                                                                                                                                                                                                          156
                                                                                                                                                                                                                                                                     345
                                                                                                                                                                                                                                                                                               102
                                                                                                                                                                                                                                                                                                                                                                             246
                                                                                                                                                                                                                                                                                                                                                  43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Biol.
                                                                                                                                                                                                                                                                                                                                                                                                       ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       s SWISS-PROT entry is copyright. It is produced through ween the Swiss Institute of Bioinformatics and the EM European Bioinformatics Institute. There are no restr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CRITICAL FOR VIRULENCE.
SUBCELLULAR LOCATION: CELL WALL.
GNDTTAMKSAALTSANFTMIKNIENVAISDAVATADLSSSAFKNSVIITTKEAADTTLTI
                         GNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAG - - - SSGKVISGNVSPSKGKMDETVNI
                                                                  VTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSK--DDQ
                                                                                                                      EFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKDKGENDSSTDKGEGL
                                                                                                                                                                                                                TITSATAVENLTVKHA-----TNVALNGGMDKLATVTLDNAALTAAIDIKSASTLNLINS
                                                                                                                                                                                                                                                                                            GTITLKAGDNLKIKQNTNENTNASSFT-YSLK----KDLTDLTSVGTEKLSFSANSNKV-
                                                                                                                                                                                                                                                                                                                         VSFATDASKSVN
                                                                                                                                                                                                                                                                                                                                                 L-FATVQASTTDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTA 101
                                                                                                                                                                                                                                                                                                                                                                            LNAIFTAITRAALLTDQAELIITKRRTNVENINIISDLETSGDFVFNGYEKVGFNVLGDI
                                                                                                                                                                                                                                                                                                                                                                                                       MNKIYRIIWNSALNAWVAVSELTRNHTKRASATVAT -----
                                                                                                         EFDSATAKTTSVTASG --
                                                                                                                                                              SVNGPKHLYSSKRRYCKFKRAAAKVK--LNT--
                                                                                                                                                                                                                                          NITSDTKGLNFAKKTAETNGDTTVHLN-GIGSTLTDTL------LNTGATTNVTND
                                                                                                                                                                                                                                                                   LTADSRTSVNLTATNDTITLTSANAATSVNLKQRQAKDAT-ITSAMQQK--YNNRRNRIA
                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Chem. 265:14529-14535(1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S-layer.
933 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96757
                                                                                                                                                                                                                                                                                                                                                                                                                                           6.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AND SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            of
                                                                                                                                                                                    KKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVR---
                                                                                                                                                                                                                                                                                                                        VETTGTITAFTA - - AGTGKVDVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         array
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Œ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Campylobacter
                                                  -SFGKTGQGGKF-SVKTGTGDDKIEFVGTTLTEGSVIDAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  epsilon
                                                                                                                                                                                                                                                                                                                                                                                                                                  87;
                                                                                                                                                                                                                                                                                                                                                                                                                               Score 194.5; DB 1;
Pred. No. 0.011;
7; Mismatches 238;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein) (SAP)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  F88C729B4BA5B1E9 CRC64;
                                                                                                      -SGKTLVIKGAEVETLVNID----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                subdivision; Campylobacter group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           THIS BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         fetus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Usage
                                                                                                                                                            TAATDQTVTLKANATDNSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cloning
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                       ----AVLATL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        restrictions on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                  181;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                        AGKISA
                                                                                                                                                                                    TYDTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ВΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ä
                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 commercial
                                                                                                                                                                                                                                                                     401
                                                                                                                                                                                                                                                                                            155
                                                                                                                                                                                                                                                                                                                                                                                                       42
647
                         424
                                                                                                                                 309
                                                                                                                                                                                                               456
                                                                                                                                                                                                                                                                                                                       344
                                                   587
                                                                                                      539
                                                                                                                                                            504
                                                                                                                                                                                      249
                                                                                                                                                                                                                                         204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             no
                                                                                                                                                                                                                                                                                                                                                                                                                                  29;
```

```
OMPA_RESULT 11
OMPA_R
ID OMPA_R
AC Q52670
AC ACLET
COC Ricket
OX NCBLIN
RA SIQUEN
RA SEQUEN
RA SEQUEN
RA CONOTI
RAL [3]
RA SEQUEN
RA CONOTI
RAL [2]
RA SEQUEN
RA CONOTI
RAL [2]
RA SEQUEN
RA CONOTI
RAL [2]
RA SEQUEN
RA CONOTI
RAL [3]
RA SEQUEN
RA RASALN
RA RASALN
RA RASALL
RA R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  무
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      νQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE-94171067; PubMed-8125327; MEDLINE-94171067; PubMed-8125327; Crocquet-Valdes P.A., Weiss K., Wa "Sequence analysis of the 190-kDa conorii (Malish 7 strain).";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     16-OCT-2001 (Rel. 40, Last sequence update)
01-MAR-2002 (Rel. 41, Last annotation update)
Outer membrane protein A precursor (190 kDa anantigen) (rOmpA) (rOmp A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q52657; P95591; P9559
Q52670; Q52674;
16-OCT-2001 (Rel. 40,
                                                 This SWISS-PROT entry is copyright. It is produced through a continuous the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict
                                                                                                                                                        of the outer surface protein IOMPA.";
Submitted (DEC-1996) to the EMPL/GenBank/DDBJ databases.
-i- FUNCTION: ELICITS PROTECTIVE IMMUNITY (BY SIMILARITY).
-i- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVER
-i- SUBCELLULAR LOCATION: CELL WALL.
-i- SUBCELLULAR LOCATION: CELL WALL.
-i- SUBCELLULAR SYMMETRY
-i- PTM: GLYCOSYLLATED (BY SIMILARITY).
-i- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                         STRAIN-Indian tick typhus, M1, Malish 7, Raoult D., Fournier P.E., Roux V., "Phylogenetic analysis of spotted fever "Phylogenetic analysis of spotted fever "."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-Indian tick typhus, M1, Malish 7, MEDLINE-97015921; PubMed-8862558; Roux V., Fournier P.E., Raoult D.; "Differentiation of spotted fever group analysis of restriction fragment length analysis of restriction fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               antigen) (rOmpA) (rOmp
OMPA OR RC1273.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OMPA_RICCN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE OF 8-204 FROM N.A. STRAIN-Indian tick typhus,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ogata H., Audic S., Renesto-Audiffren P., Po
Samson D., Roux V., Cossart P., Weissenbach
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=21442074; PubMed=11557893;
Ogata H., Audic S., Renesto-Audiffren P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gene 140:115-119(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; alpha subdivision; Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rickettsia conorii.
                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF 953-2012 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      J. Clin.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Raoult D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=Malish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
STRAIN=Malish 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mechanisms of evolution in Rickettsia science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   of the gene encoding the protein rOmpA."; lin. Microbiol. 34:2058-2065(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AIGG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NKDQVI-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TNIALGTAAADKALV-----IDTGIETLNITSLVKATSPETTANTVNAKLTDVTSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAYLPGKSMM 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P95592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -NFTAADAGSVKLITVKLN---DVTALMIVVKIVLDAAAKD------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -GTYRG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P95593; P95594; Q52667;
                                                                                                                                                                                                                                                                                                                                                                                                        M1, Malish 7, and Moroccan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----EAGYAIGYSSISDGGNWIIKGTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Walker D.H.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              antigen-encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2021 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7,
                                                 There are no restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            conorii
                                                                                                                                                                                                                                                                                                                                                 group rickettsiae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rickettsiae by sequencing and polymorphism of PCR-amplified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Fournier P.-E.,
ch J., Claverie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   antigen)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Moroccan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q52668;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (Cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          prowazekii.
                                                                                                                                                                                                                                             COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q52669
                                                                                                                                                                                                                                                                                                                                                    bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Barbe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rickettsia
                                                                                     collaboration -
L outstation -
                                                                                                                                                                                                                                                                                                                                                      study
                                                                                                                                                                                                                                             ВY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  690
                                                       g
```

non-profit institutions as long and this statement is not removed

removed.

Usage

bу

and

for

commercia.

9

as its content

```
망
Ş
                             Qy
                                                                                          Query Match
Best Local S
Matches 165
                                                                                                                                                                          CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                              CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                  CONFLICT
                                                                                                                                   CONFLICT
                                                                                                                                                           CONFLICT
                                                                                                                                                                                                                                            CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                       SIGNAL
CHAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             entities
or send a
                                                                                                                                                                                                                                                                                                                                                      VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL;
EMBL;
EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT
VARIANT
                                                                                                                   CONFLICT
                                                                                                                          CONFLICT
                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                                                                                                                              CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Complete
                                                                                                                                                                                                                                                                                                                                                                               VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                         VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ptam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        InterPro; IPR003858;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL;
                487
89
                                 10
                                                Match 6.4%;
Local Similarity 21.7%;
nes 165; Conservative 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AE008674; AA103811.1;

U43798; AAB49550.1;

U43798; AAB49551.1;

U43806; AAB49551.1;

U45244; AAB49566.1;

U45244; AAB49566.1;

U46918; AAA86663.1;

U83440; AAC35176.1;

U83440; AAC35176.1;

U83443; AAC35189.1;

U83443; AAC35189.1;
VLSFRSDKEGTGEKEVTEDSNWG-VYFDKKGVLTA---
                NNGIVTFTGDSTVTGNIGNTNALATISVGAGKATLGGAIIKATTTKLTD-----NAS
                                NSALNAWVAVSELTRN-HTKRASATVAT-AVLATLLFATVQASTTDDDDLYLEPVQRTAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PF02708; rOmpA_rom
en; Repeat; Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  U01028; AAA17405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           requires
                                                                                          898
908
908
1009
1013
1182
1314
1451
1624
1628
1872
1877
1878
1878
1878
1878
                                                                                                                                                                                                                                                                                                                                                                                              39
238
1424
60
76
86
126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    email
                                                                                                                                                                                                                                                     640
669
793
803
                                                                                                                                                                                                                                                                                              10
92
126
137
157
368
374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  s
a
                                                                                                  898
908
909
1009
1013
11182
1314
1451
1624
1628
1628
1879
1879
1879
                                                                                                                                                                                                                                                                                                                                                                                                               38
2021
946
1528
60
76
                                                                                                                                                                                                                                                                                              1308
1877
10
92
126
137
137
157
369
                                                                                                                                                                                                                                             640
669
793
804
823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  license agreement (See http://www.isb-sib.ch/announce/license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 _rOmpB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rOmpA_rOmpB.
                                                                                         203328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Cell wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N -> D (IN REF. 1).

V -> I (IN REF. 1).

N -> D (IN REF. 1).

VN -> IS (IN REF. 1).

LLEWGGGVVKSNTIN -> KAT

REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

D -> Y (IN REF. 1).

L -> S (IN REF. 1).

D -> Y (IN REF. 1).

E -> G (IN REF. 1).

D -> Y (IN REF. 1).

E -> A (IN REF. 1).

MS -> LP (IN REF. 1).

MS -> LP (IN REF. 1).

MS -> LO (IN REF. 1).

MS -> R (IN REF. 1).

MS -> R (IN REF. 1).
                                                 90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .'
                                                                                                                                                                                                                                                                                            Score 193; DB 1;
Pred. No. 0.033;
0; Mismatches 269;
                                                                                                                                                                                                                                                                     REF.
N ->
V ->
                                                                                                                                                                                                                                                                                                                                                                             MISSING (IN STRAIN M1).
MISSING (IN STRAIN MOROCCAN).
VT -> II (IN STRAIN INDIAN TICK D -> A (IN STRAINS INDIAN TICK T
                                                                                                                                                                                                                                                                                                                                                                                                                                       OUTER MEMBRANE THR-RICH.
                                                                                                                                                                                                                                                                                                                                                                                                                                THR-RICH
                                                                                                                                                                                                                                                                                                                                                                                                                                                        POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                             -> NN (IN STRAIN INDIAN
                                                                                                                                                                                                                                                                                             > I (IN STRAIN INI
> K (IN REF. 1).
> V (IN REF. 1).
> I (IN REF. 1).
> N (IN REF. 1).
> N (IN REF. 1).
> VN (IN REF. 1).
-> VN (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                              (IN STRAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S-layer;
                                                                                                            (N REF. 1)

N REF. 1)

N REF. 1)

REF. 1)

N REF. 1)

PF. 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Glycoprotein;
                                                                                                                                                                                                                                                                                      ).
> LLQVQGGVVKANTIN
                                                                                                                                                                                                                                                                                                                                                      MOROCCAN)
                                                                Length 2021;
-GTITLKAG---
                                                                                                                                                                                                                                             KATLGGAIIKATTTK
                                                                                                                                                                                                                                                                                                                                                                                                                       INDIAN
                                                                                                         REF.
                                                 Indels
                                                                                          CRC64;
                                                                                                                                                                                                                                                                                                                                                       TICK
                                                                                                                                                                                                                                                                                                                                                                                                                TICK
                                                                                                         TICK TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                             CK TYPHUS).
K TYPHUS, M1
                                                                                                                                                                                                                                                                                                                                                      TYPHUS).
-DNLKI 114
                                                Gaps
                                                                                                                                                                                                                                             (IN
                                                                                                                                                                                                                                                                                              (IN
                538
                                 67
                                                 36;
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                   OMPB_RICTY
                                                                                                                                                                                                                                                                                                                                                 RESULT
                                                                                                                                                                                                                                                         OMPB_RICTY STANDARI
P96989;
15-JUL-1998 (Rel. 36, 0
15-JUL-1998 (Rel. 36, 1
16-OCT-2001 (Rel. 40, 1
                                                                                                                                                                                  15-JUL-1998 (Rel. 36, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rompB)
(romp B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide OMPB OR SLP.
surface
Gene 133
[2]
                SEQUENCE FROM N.A.
STRALN=WILMINGTON;
STRALN=WILMINGTON;
MEDLINE=94040787; PubMed=8224886;
Hahn M.-J., Kim K.-K., Kim I., Chang W.-H.;
"Cloning and sequence analysis of the gene encoding surface layer protein of Rickettsia typhi.";
Gene 133:129-133(1993).
                                                                                                                            Bacteria; Proteobacteria; Rickettsiaceae; Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                             1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                   1109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1052
                                                                                                                                                                          Rickettsia typhi.
                                                                                                                                                                                                                                                                                                                                                                                                                       545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                760
                                                                                                                                                                                                                                                                                                                                                                                          -INDATYTIDANNGNLNIPAGNIKFAHADAQLILQNSSGNDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ALDSALVLSNLTGVGVNNILLAADLVAPGVDEGTVVFDGGVNGLNIGSNVA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ISGNVSPSKGKMDETVNINAGNNIEI--TRNGKNIDIATSMTPQFSSVSLGAGADAP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKGT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NTINLTDNASAVTFTNPVVVTGAIDNTGNANNGIVTFTGDSTVTGNIGNTNALATISVGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TETNPVVVTGAIDNTGNANNGIATETGDSTVTGNIGNTNALATVNVGAGLLRVQGGVVKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NALATVNV-GAGIATLEGAVIKATTTKLTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AIGGGTY----
                                                                                                                                                                                                                                                                                                                                                                                                                                                   GDVGGNKFNTLLIYNAVTITDDVNLEGIQNVLINNNADFTSSTAFNAGTIQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KGAIANGNNAILNVNTKLLTAYHLTIGTVAEINIGAGNLFAIDASAGDVTILNAQDIHFR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --TLSVDDEGALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VTGNIGNTNAL -- ATVNVGAGVTLQAGGSLDANNIDFGARSTLEFNGPLDGGGNAIPYYF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKATLGGAIIKATTTKLTDNASAVTFTNPVVVTGAID-----NTG-NANNGIVTFTGDST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KEKDGKLVTG----KDKGENDSSTDKGEGLVTAK----EVIDAVNKA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTGVDNVGVLNLNGALSQVTGNIGNTNALATISVGAGKATLGGAVIKATTTKLTDNASAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TTASDNVDFVRTYDTVEFLSADTKTT----TVNV---ESKDNG---KRTEVKIGAKTSVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KATTTKLTDNASAVTFT-----NPVVVTGAIDNTGNANNGIVTFTGNS----TVTGNIGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KQNTNENT-NASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAET
                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                              Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                    -RGEAGYAIGYSSISDGGNWIIKGTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV
                                                                                                                                              alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -GQTGQADK-----FETVT---SGTN----VTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ---HIDNVDGNARAGIAQAIA-TAGLVQAYLPGKSMM
                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VAPGVKEGDV----
                                                                                                                                                                                                                                                                                                                      1645
                                                                                                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----DANK-PVRITN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----TNVAQLKGVAQNL
                                                                                                                                                             Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AASVLTLTNVNAVLTGAIDN
                                                                                                                                                                                                                                                                                                                                                                                             1200
                                                                                                                                                                                                                                                                                                                                                                                                                       581
                                              the
                                              crystalline
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GWRMKT
                                                                                                                                                                                                       e protein peptide].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      650
```

SEQUENCE

```
SOPTITITITITES OF THE PROOF OF 
                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                           δÔ
                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
                                  Š
                                                                                   В
                                                                                                                           δÃ
                                                                                                                                                                              무
  뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 membrane protein of rickettsiae: identification of an a mutant deficient in processing,", Infect. Immun. 60:159-165(1992).

-i- FUNCTION: THE 120 kDa SURFACE-EXPOSED PROTEIN IS A STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKE VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.

-i- FUNCTION: THE 32 kDa BETA PEPTIDE MAY SERVE AS A ME-i- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONFLICT
CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      prowazekii."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE-92114896; PubMed=1370573;
Ching W.M., Carl M., Dasch G.A.;
Ching W.M., Coarl M., Datch G.A.;
Mapping of monoclonal antibody binding sites on
the S-layer protein antigens of Rickettsia typhi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Hackstadt T., Messer R., Cieplak W., Peacock M.G.;
"Evidence for proteolytic cleavage of the 120-kilodalton outer
membrane protein of rickettsiae: identification of an avirulen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE-92104668;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-WILMINGTON;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           InterPro;
    296
                                                                                                                                                                              200
                                                                                                                                                                                                                       174
                                                                                                                                                                                                                                                                    155
                                                                                                                                                                                                                                                                                                             119
                                                                                                                                                                                                                                                                                                                                                          100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DENTIFICATION
                                            280
                                                                                                                                  234
                                                                                                                                                                                                                                                                                                                                                                                                   65
                                                                                                                                                                                                                                                                                                                                                                                                                                               40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ween the Swiss Institute of Bioinformatics European Bioinformatics Institute. There a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S-LAYER WITH HEXAGONAL SYMMETRY.
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SWISS-PROT entry is copyright.
                                                                                                                                                                                                                                                                                                                                                       LAVTIN----
                                                                                                                                                                                                                                                                                                                                                                                                      TAVVLSFRSDKEGTGEKEVTEDSNWGVYFD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                               NRTTNAAATTVDGAGFDQTGAGVNLPVATNSVITANSNNAITFNTPNGNLNSLFLDTANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NHTKRASATVA-----TAVLATLLFATVQASTTDDDD-----
LKGV1EFDTTAAAGKLIANGGAANAV1GTDNGAGRAAGF1VSVDNGNAAT1SGQVYAKD1
                                                                                                                                                                                                                     NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG
                                                                                                                                                                                                                                                                      VSKVNAGAAIND-
                                                                                                                                                                                                                                                                                                             NENTNASSFTYSLKKDLTDLTSVGTEKLSFSA----NSNKVNITSDTKGLNFAKKTAET
                                            TSVIKEKD----
                                                                                                                                  TTASDNVDFVRTYDTVEFLSADTKTTTVNVESKD--
                                                                                                                                                                              LGDNAKIVNGANGIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    L04661; AAB48987.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PF02708; rOmpA_rompB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                     •NQGLMFNTTPDAANALNLQGGGNTINFNGRDGTGKLVLVSKNGNATEFNVTGSLGGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IPR003858;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1415
657
842
1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29:95-105(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OF CLEAVAGE SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ΑΑ,
                                                                                                                                                                                                                                                                                                                                                       ENTTLGFVTNVTKQGNFFNFTIGAGKSLTITGHGITAQQAATTKSAQNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PubMed=1729180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1645
1429
657
842
1071
1306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Transmembrane;
1353 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rOmpA_rOmpB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             21
21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   169698
                                                                                                                                                                                                                                                                 NDLSGVGS - - IDFTAAPSVLEFNLINPTTQEAPL - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEMBRANE ANCHOR (POTENTIAL).
H -> N (IN REF. 2).
V -> I (IN REF. 2).
G -> A (IN REF. 2).
G -> S (IN REF. 2).
MW; 0CB5641C7EB185EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                     VTGKDKGENDS----STDKG----
                                                                                                                                                                              NITNGFV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KDA BETA PEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KDA SURFACE-EXPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          192.5;
No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              It is produced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; DB
                                                                                                                                                                                                                                                                                                                                                                                                 KKGVLTAGTITLKAGDNLKIKONT
                                                                                                                                                                              ----KVSDKTFAG--IKTINIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     258;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CNBr fragments and Rickettsia
                                                                                                                               NGKRTEVKI - - - - GAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RICKETTSIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ------LYLEPVQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           through
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               avirulent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MAJOR
                                         EGLVTAKEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1645;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   247;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         collaboration
Coutstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ВУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ×
                                                                                                                                                                                                                                                                                                             173
                                                                                                                                                                                                                                                                                                                                                                                                 118
                                                                                                                                                                                                                                                                                                                                                                                                                                               99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         64
                                         315
                                                                                   295
                                                                                                                               279
                                                                                                                                                                           237
                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     36;
```

```
OMPB.RESULT 13
OMPB.R 10
OMPB.R 20
ID OMKEN 3
AC 09KKA3
DT 16-CCT
DT 16-CCT
DT 01-MAR
DE (Surfar
R NCBLT
RN 101
RP SEQUEN
RC STRAIN
RA Ogata
RA Ogata
RA Ogata
RA Samson
RA SITRAIN
RC STRAIN
RX MCDLLY
RY MEDLLY
RY SEQUEN
RY MEDLLY
RY MEDLY
RY MEDLY
RY SEQUEN
RY STRAIN
RY SEQUEN
RY SEQUEN
RY SEQUEN
RY SEQUEN
RY STRAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
STRAIN-Malish 7;

K MEDLINE-21442074; PubMed-11557893;

K Medline-2142074; PubMed-11557893;

Maria H., Audic S., Renesto-Audiffren P.

Ponix V., Cossart P., Weissen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9KKA3; Q9KK98; Q9KK98; Q9KK98; Q9KKA3; Q9KKA3; Q9KKA3; Q9KK98; Q9KK98; Q9KK98; Q9KK98; Q9KKA3; Q9KK98; Q9KK98
                               Stenos J., Walker D.;
"The rickettsial outer membrane protein A and B genes of Rickettralis, the most divergent rickettsia of the spotted fever australis, the most divergent rickettsia of the spotted fever submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.

-!- FUNCTION: THE 120 KDA SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OMPB_RICCN STANDARD
Q9KKA3; Q9KK98; Q9XC45;
                                                                                                                                                                                                                                                                                                                                     "Phylogenetic analysis of members of the genus Rickettsia gene coding the outer-membrane protein rOmpB (ompB)."; Int. J. Syst. Evol. Microbiol. 50:1449-1455(2000).
                                                                                                                                                                                                                                   STRAIN-Malish 7;
                                                                                                                                                                                                                                                                             SEQUENCE OF 353-1655
                                                                                                                                                                                                                                                                                                                                                                                                                                       Roux V., Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-Indian tick typhus, and Malish MEDLINE-20393643; PubMed-10939649;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF 33-1649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Mechanisms
Science 293:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rickettsiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rickettsia conorii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GTN--LGSAESPLSNIHFATKAANG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGNWIIKGTASGNSRGHFGASASVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SSKTILNAGDVAINELVMENDGSVHLTHNTYLITKTINAANQGKIIVAADPINTDTALAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IAQAIATAGLV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TIQLTSTQNNILVDFDLDVTTDQTGVVDASSLTNNQTLTINGSIGTIGANTKTLGRFNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSIQLDGSAIITGDIGNGAVNAALQDITLANDASKILTLSGANIIGANAGGAIHFQANGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTNIKAIEVEGAGIVQLSGIHGAELRLGNAGSIFKLA-DGTVINGPVNQNPLVNNNALAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DFGNLAVQIVVPNNKILTGNFIGDA---;---KNNG-NTAGVITFNANGTLVSGNTDPNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DQGNITVMYDVN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                V-----IQSANAGGQVTFEHLVDVGLGGKTNFKTADSKVIITENASFGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IDAVNKAGWRMKTTTANGQT------GQADKFETVTSGTNVTFASGKGTTATVSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KGKMDETVNI - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              - DAPTLSVDD---EGALNVGSKD---ANKPVRITNVAP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           of evolution in :2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rickettsieae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FROM N.A.
      AND/OR
                                                                                                                                                                                                                                                                         FROM
                                                                                                                                                                                                                                                                             N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       alpha subdivision;
eae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -VGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DVTNVAQLKGVAQN----LNNHIDNVDGNAR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Weissenbach
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -QAYLPGKSMMAIGGGTYRGEAGYAIGYSSISD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -NAGNNIEITRNGKNIDIATSMTPQFSSVSLGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ρ.,
      DURING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              conorii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Fournier P.-E.,
th J., Claverie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -GVKEG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              prowazekii.
      (BY
                                                                                                                                                                    Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    J.
                                                                                                                                                                                                                                                                                                                                                                                                           using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Barbe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ÄG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ۲,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       400
```

Ωy 밁 Qγ 밁 δÃ 밁

Ş Вb

```
Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mouried and this statement is not removed.
entities requires a license agreement 'cocor send an email to 'ico
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             InterPro; IPR003858; rOmpA_rOmpB
Pfam; PF02708; rOmpA_rOmpB; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           211
 368
                                                                          330
                                                                                                                                                                                                                    224
                                                                                                                                                                                                                                                                                           167
                                                                                                                                                                                                                                                                                                                                                                                                    264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
hes 149; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                       70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY). SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (BY SIMILARITY).
SUBCELLULAR LOCATION: CELL WALL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SIMILARITY). FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NGTLN-----VTNGFIKVSSKSFATVNVINIGDGQGIMFNTDADNVNTLNLQANGATI 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NSALNAWVAVSELTRNHTKRASATVATAVLATLLFATVQASTTDDDDLYLEPVQRTAVVL 69
                                       TITGDIGNAGGAAALQGITLANDATKTLTLGGANIIGANGGTINFQANGGTIKLTS--TQ
                                                                          TANGQTGQA----
                                                                                                            HAAELRIGNAGSVFKLADGTVINGK----VNQTALVGGALAAGTITLDG
                                                                                                                                            KRTEVKIGAKTSVIKEKDGKLVTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTT 329
                                                                                                                                                                                   NFTGDASNPGNTAG-----VITFDANGTLASASADANVAVTNNITAIEASGAGVVQLSGT 474
                                                                                                                                                                                                                    GWNIKGVKPGTTASDNVDFVRTYD---TVEFLSADTKTTTVN----VESKDNG-
                                                                                                                                                                                                                                                        ANAVGQVNFRHIVDVGTDGTTAFKTAASKVAITQNSNFGTTDFGNLAAQIIVPNTMTLNG
                                                                                                                                                                                                                                                                                         AKKTAETNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKD---VLNA 223
                                                                                                                                                                                                                                                                                                                                                                NENTNASSFTYSLKKDLTDLTSVGTEK-----LSFSANSNKV----NITSDTKGLNF
                                                                                                                                                                                                                                                                                                                                                                                                  TF-NGTDGTGRL------VLLSKNAAATDFNVTGSLGGNLKGIIEFNTVAVNGQLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                       SFRSDKEGTGEKEVTEDSNWGVYFDKKGVLTAGTITLKAGDNLK--IKQNT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AE008659;
AF123721;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AF149110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AF123726;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1335
61
75
78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAL03623.1;
; AAF34124.1;
; AAF34129.1;
; AAD39533.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1655
61
75
78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cell wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               251
413
959
988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6.4%;
NVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM-D 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        168342
                                                                                                                                                                                                                                                                                                                               ----VIGTNNGAGRAAGFVVSVDNGKVATIDGQVYAKDMVIQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120 KDA SÜRFACE-EXPOSED PRO
32 KDA BEFA PEPTIDE.
P -> A (IN STRAIN INDIAN TI
G -> S (IN STRAIN INDIAN TI
K -> N (IN STRAIN INDIAN TI
V -> A (IN STRAIN INDIAN TI
V -> A (IN STRAIN INDIAN TI
V -> D (IN STRAIN INDIAN TI
N -> T (IN STRAIN INDIAN TI
N -> GH (IN REF. 3).
F -> S (IN REF. 3).
F -> S (IN REF. 3).
G -> S (IN REF. 3).
H -> R (IN REF. 3).
H -> R (IN REF. 3).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.

1. Complete proteome.

120 KDA SURFACE EXPOSED PROTEIN.
                                                                        DKFETVT-----SGTNVTFASGKGTTATVSKDDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 192.5; DE
Pred. No. 0.027;
8; Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        THIS BACTERIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                283;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ×
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            γd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IS COVERED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N TICK TYPHUS).
N TICK TYPHUS).
N TICK TYPHUS).
N TICK TYPHUS).
N TICK TYPHUS).
N TICK TYPHUS).
N TICK TYPHUS).
N TICK TYPHUS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEMBRANE ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  155;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BY A S-
                                                                                                            SA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            n no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                        419
                                                                                                                                                                                                                                                                                                                                                                166
                                                                                                                                                                                                                                                                                                                                                                                                    313
                                                                                                                                                                                                                                                                                                                                                                                                                                       118
                                                                                                                                                                                                                                                                                                                               359
                                       579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  31;
```

20

Вþ Qy Дb Q Db δÃ

Qy Вþ S S В Qy В

Ş 망

This

SWISS-PROT

entry

is

copyright.

Ιt is

through

a collaboration

```
RESULT
WAPA_BA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WAPA_BACSU
Q07833;
Q1-OCT-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LT 14
_BACSU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "Molecular analysis of three major wall-associated proteins of
Bacillus subtilis 168: evidence for processing of the product
gene encoding a 258 kDa precursor two-domain ligand-binding
                                                                                                                                               "Sequencing of a 65 kb region of the Bacillus subt containing the lic and cel loci, and creation of a covering the gnt-sacxy region.";
Microbiology 142:3113-3123(1996).

-j- FUNCTION: STILL UNKNOWN. NOT INVOLVED IN CELL MOTILITY, SECRETION OR DIFFERENTIATION.
                                                                                                                                                                                                                                                                                                                        Yoshida K.-I., Sano H., Seki S., Oda M., Fujimura M., Fujita Y.; "Cloning and sequencing of a 29 kb region of the Bacillus subtilis genome containing the hut and wapA loci."; Microbiology 141:337-343(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-OCT-1994
01-MAR-2002
                                                                                                                                                                                                                                    Miwa Y., Fujita Y
                                                                                                                                                                                                                                                     MEDLINE=97124196; PubMed=8969509; Yoshida K.-I., Shindo K., Sano H.,
                                                                                                                                                                                                                                                                                    STRAIN=168 / BGSC1A1;
                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=95219088; PubMed=7704263;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mol. Microbiol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=1423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Firmicutes; Bacillus/Staphylococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacillus subtilis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WAPA OR N17G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Wall-associated protein precursor
                                                                                                                                                                                                                                                    Yoshida K.-I., Shindo K.,
                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Foster S.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=93302506; PubMed=8316082;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                580 NNIVYDEDLAIATDQTGVVDASSLTNAQTLTINGKIGTVGANNKTLGQENIGSSKTVLSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            808 ADGTG 812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       640
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                           SIMILARITY: THE REPEATED MOTIF IN THE C-TERMINUS HAS SOME SIMILARITY TO THE REPEAT IN E.COLI RHS GROUP OF PROTEINS (RHSA-D).
                                                       C-TERMINUS CONSISTS OF TWO MOTIF REPEATED 31 TIMES.
                                                                       DOMAIN: HAS TWO LIGAND-BINDING DOMAINS; THE N-TERMINUS, HAS 101 AA REPEATS WHICH ARE RESPONSIBLE FOR CELL WALL BINDING; C-TERMINUS CONSISTS OF TWO BLOCKS OF RESIDUES WITH A CONSERV
                                                                                                                   SUBCELLULAR LOCATION: MEMBRANE-ASSOCIATED. INTO THE MEDIUM.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDVAINELVIGNNGAVQFAHNTYLITRTTNAAGQGKIIFNPVVNNNTTLATGTNLGS-AT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ETVNIN---AGNN--IEITRNGKNIDIATSMTPQ----FSSV----SLGAGADAPTLSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GNSRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----TVGGQQGNKFNTVALDNGTTVKFLGNATFNGNTTIAAN-STLQIGGNYTADFVAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NPLAEINFGSKGAANVDTVLNVGKGVNL-YATNITTTDA---NVGSFIFNAGGTNIVSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AQAIATAGLVQ-----AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Rel. 30, Created)
(Rel. 30, Last sequence u)
(Rel. 41, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                       BGSC1A1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  8:299-310(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacillus/Clostridium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                group; Bacillus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                       Seki S., Fujimura M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ą
produced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               group;
                                                                                                                                                                                                            subtilis
of a 177
                                                                                                                                    MAY
                                                                                                                                                                  MEMBRANE METABOLISM,
                                                                                                                                    ΒE
                                                                                                                                                                                                            genome
kb contig
                                                                                                                                                                                                                                                        Yanai N.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               753
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     639
```

use by non-profit institutions as long as its content modified and this statement is not removed. Usage by ar entities requires a license agreement (See http://www.isb.

(See http://www.isb-sib.ch/announce/

for in

commercial

no

on way

restrictions and

EMBL outstation

ween the Swiss Institute of Bioinformatics and the European Bioinformatics Institute. There are no  $r\epsilon$ 

```
δÃ
                                                                                                              밁
                                                В
       Qy
                                                            δÃ
                                                                          Query Match
Best Local S
Matches 113
                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL;
EMBL;
                                                                                                                                                                           REPEAT
REPEAT
                                                                                                                                                                                                      REPEAT
REPEAT
                                                                                                                                                                                                                    REPEAT
REPEAT
                                                                                                                                                                                                                                  REPEAT
REPEAT
                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                           REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                               REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                   REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                     REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                              Cell
                                                                                                                                                                                                                                                                                                                                                                                                    PIR; S32920; S32920.
SubtiList; BG10797; wapA.
InterPro; IPR003305; CBD_6.
Pfam; PF02018; CBD_6; 1.
                     1007
                                                                                                                          REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                        SIGNAL
                                                                                                                                                REPEAT
                                                                                                                                                             REPEAT
                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                       REPEAT
                                                                                                                                                                                                                                                             REPEAT
                                                                                                                                                                                                                                                                                                                                              DOMAIN
                                                                                                                                                                                                                                                                                                                                                                   REPEAT
                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
                                                                                                                                         REPEAT
                                                                                                                                                      REPEAT
                                                                                                                                                                                         REPEAT
                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                REPEAT
        150
                                                950
                                                                            hes 113;
                                                              45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                              wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                D31856; BAA06656.1;
D29985; BAA06260.1;
D83026; BAA11683.1;
Z99124; CAB15959.1;
NAYFNKKGG
                            GVYFDKKGVLTAGTITLKAGDNLKIKQNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFS
                                                             ATVQASTTDDDDLYLEPVQRTAVVLSFRSDKEGTGEK-----EVTEDSN------W
                                                AETSVISTDGGAMYID---EDATTHRFTKKADGTYQPPTGVYLELTETADQFILKTKDQT
                                                                                                                                                                                                                                                                                                                                                                                                                                                            L05634; AAA22883.1;
                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                              Repeat; Signal; Complete proteome
                                                                                                                                                                                                                                                                                  1083
1109
1129
1150
1174
                                                                                                                                                                           1887
1908
1929
                                                                                                                                                                                                                                                1690
                                                                                                                                                                                                                                                             1646
                                                                                                                                                                                                                                                                                                                   1042
                                                                                                                                                                                                186
                                                                                                                                                                                                       1840
                                                                            Conservative
                                                                                                             Ã,
                                                                                                                                                                                                                                                                                                                                                     2334
2334
869
605
736
869
                                                                                                                                                                                                                           1082
11102
11128
11148
11169
11193
11218
11218
11238
11238
11665
11686
11686
11730
11730
                                                                                                                                                                                                      1839
1859
                                                                                                                                                                                                                    1814
                                                                                                                                                                           1880
1906
1927
1948
                                                                                 6.3%;
                                                                                                              258329
                                                                                                                                                                                                                                                                                                                                                                                                                                                            .'
                                                                            65;
                                                                                                             WW;
                     KLQKVVDGHNNATVYTYNDKNQLTAITDASGRKLTFT
                                                                          Score 190; DB 1;
Pred. No. 0.054;
5; Mismatches 156
                                                                                                                                                                                                                                                                                                                                                                       OR 32 (POTENTIAL).
WALL-ASSOCIATED PROTEIN.
3 X 101 AA APPROXIMATE TANDEM REPEATS
                                                                                                                                                                                                                                                                                                                                       31 X 21 AA APPROXIMATE TANDEM REPEATS X(4)-G-X(4)-[YF]-X-D-X(2)-G-X(4).
                                                                                                             B75138CCD278BAA3 CRC64;
                                                                                                                                                                   (APPROXIMATE).
                                                                            156;
                                                                                        Length 2334;
                                                                            Indels
                                                                           144;
                                                                          Gaps
                                  149
                     1052
                                                1006
                                                             89
                                                                                                                                                                                                                                                                                                                                              S
S
                                                                            24;
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 15
YPJA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TYPIA_ECOLI

P52143; P76610; P77017; F,...

1 01-CCT-1996 (Rel. 34, Created)

1 01-NOV-1997 (Rel. 35, Last sequence upda'

1 16-CCT-2001 (Rel. 40, Last annotation upformation of the control of the cont
                                                                                                                                                                                                                                                                                                              Oshima T., Oyama S., Saito N., Sampel G. Tagami H., Takahashi H., Takeda J., Take Yamagata S., Horiuchi T.;
"Construction of a contiguous 874-kb sec. Kl2 genome corresponding to 50.0-68.8 analysis of its sequence features.";
DNA Res. 4:91-113(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1101
                                                                   use by non-profit institutions as long modified and this statement is not removed entities requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced the between the Swiss Institute of Bioinformatics and the European Bioinformatics Institute. There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Yamamoto Y., Alba H., Baba T., Hayashi K., Inada T., Isono K
Itoh T., Kimura S., Kitagawa M., Makino K., Miki T., Mitsuha
Mizobuchi K., Mori H., Nakade S., Nakamura Y., Nashimoto H.,
Oshima T., Oyama S., Saito N., Sampei G., Satch Y., Sivasund
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gregor J., Davis N.W., Kirkpatrick H.A., Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Blattner F.R., Plunkett G. III, Bloch C.A., Riley M., Collado-Vides J., Glasner J.D., R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1053 YDENG-HVTSITGPKN--KKV-----TYSYENDLLKKVTDT---DGTVTSYDYDSEGRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN=K1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=K12 / MG1655;
MEDLINE=97426617; PubMed=9278503;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=97349980;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "The complete genome sequence of Escherichia coli K-12."; science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Escherichia coli
                                                                                                                                                                                                                                                                    -!- SIMILARITY: STRONG, TO BORDETELLA PERTACTIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              210
                                                                                                                                                                                                                                                                                              SUBCELLULAR LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VKQYSA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SKDLSASTN--ILKDG-----SFEAQKSGWNLTASKDRRKISVIADKSGVLS-GSK 1329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKDDQGNIT-VMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG-KMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV--DDEGALNVGSK 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KTLLM--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MKDTEGNVTDIAYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KTTTVNVESKDNGKRTEV---KIGAKTSVIKEKDGKLVTGKDKGENDS-----STDKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EKKRAASVKDVLNAGWNIKGVKPGTTA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TQPNGRKVQYGYNEAGNPIQVIDDAEGLKITTNTKYEGNNVVEDVDPNDVGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PubMed=9205837;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -NSTEAKPVFTEYQYSGHRLEKAINAKKETYVYSYD-----
                                                                                                                                                                                                                                                                                            Outer membrane (Potential).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---ESYQYDKDGNVTSVKDAYGTE-TYEYNKNNDVTK 1238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    on update)
ypjA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                    It is produced through a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                               Takemoto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -GLDAVSETDQSGKSSSAAVYDKYGNQIQS
                                                                                                                                                                                                                                                                                                                                                                    sequence of the Escherichia
8.8 min on the linkage map an
                                                                                          (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Goeden M.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ₽
                                                                                                                                           as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rode
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Perna N.T., ode C.K., May
                                                                                                                      Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SDNVDFVRTYDTVEFLSADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a N.T., Burland
.K., Mayhew G.F.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTNVTFASGKGTTATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Uehara
                                                                                                                                                                                               the
                                                                                                                      γd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sivasundaram
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Isono K.,
Mitsuhashi
                                                                                                                                                             restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rose
                                                                                                                      and
                                                                                                                                                                                                 EMBL
                                                                                                                      for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .F.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADK
                                                                                                                                                                                                 outstation
                                                                                                                                                                                                                                                                                                                                                                       and
                                                                                                                      in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                               c ;
                                                                                                                                                                                                                                                                                                                                                                                                coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               307
```

U36840; A: AE000350;

AAA79815.1; ALT\_SEQ. 0; AAC75695.1; -.

```
밁
                                      Qy
                                                                             DЬ
                                                                                                                  Qy
                                                                                                                                                           Вb
                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                       Д
                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                       20
                                                                                                                                                                                                                                                                                                                                                                                                Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DR
DR
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity 20.7
                                                                               1164
                                                                                                                                                           1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; D90889; BAA16514.1; ALT_INIT.
EMBL; D90890; BAA16518.1; ALT_INIT.
ECOGENE; EG13213; ypjA.
Hypothetical protein; Outer membrane; Complete proteome.
Hypothetical protein; Outer membrane; Complete CRC64;
SEQUENCE 1569 AA; 162774 MW; 0D006A9A32154596 CRC64;
                                                                                                                                                                                                                                 1049 LEGAVRITDSATLTLGNGVDTTLADLTAASRGSVWLNSNNSCAGTSNCEYRVNSLL--LN 1106
1216 NSNWNLTNDVKPN 1228
                                                                                                                                                                                                  493
                                                                                                                                                                                                                                                                              449
                                                                                                                                                                                                                                                                                                                  989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 650
                                                                                                                                                                                                                                                                                                                                                         404
                                                                                                                                                                                                                                                                                                                                                                                                931
                                                                                                                                                                                                                                                                                                                                                                                                                                     348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   821 ANGGVLTVESDTSSDKTQVNMGGR-EIVKTKATATGTTLTGGEQIVEGVANETTINDGGI 879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          262 -----NVESKDNGKRTEVKIGAKTSVIKEK------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        179 VHLNG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    592 --ASTTSGTLIEGTNSYGDAFYIRNSEAKNVVLENAGSLTVVTGSRAVDTIINANGKMDV 649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    534 TVVAKTSAKNTTIDTGGKL-IVQKEAKTDSTRLNNGGVLEVQDGGEAKHVEQQSGGALI- 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 41 TLLFATVQASTTDDDDLYLEPVQRTAVVLSFRSDKEGT-----GEKEVTEDSNWGVYFD 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VTGKDKGENDSSTDKGEGLVTAKE---VIDAVNKAGWRMKTTTANGQTGQADKFETVTSG 347
                                      -GNWIIKGTASGN 579
                                                                             FKI----FVQDTGVSPQSDDAMTLVKTGG----GDASFTLGNTGGFVDLGTYEYVLKSDG
                                                                                                                  ARAGIAQAIATAGLYQAYLPGKSMMAIGGGTYRGEAGYAIG-----YSSISDG 567
                                                                                                                                                       DGDVYLSAQTAAPATTNGIYNTLTTNELSGSGNFYLHTNVAGSRGDQLVVNN---NATGN 1163
                                                                                                                                                                                                                                                               -----FSSVSLGAGADA--PTLSVDDEGALNVGSKD-----ANKPVRITNVAPGVK 492
                                                                                                                                                                                                                                                                                                                GQYTLGRSKDEFQALARAEDLQVAGGTAIVYAGTLADASVSGATGSLSLMTPRDNVTPVK 1048
                                                                                                                                                                                                                                                                                                                                                       GKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATS-----MTPQ-----
                                                                                                                                                                                                                                                                                                                                                                                        THQYGTFSISGNLATNMLLENGGNLLVLAGTEARDSTVGKGGAMQNLG--QDSATKVNSG 988
                                                                                                                                                                                                                                                                                                                                                                                                                               TNV--TFASGKGTTATVSKDDQGNITVMYDVNVGDAL--NVNQLQNSGWNLDSKAVAGSS 403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QTVSANGEAIKTKINEGGTLTVNDNGKATDIVQNSGAALQTSTANG-----IEISG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTLDVREKGSATGIQQ-----SSQGALVATTRATRVTGTRA-DGVAFSIEQGAANNILL 820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VTDD--EKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTV-- 261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 THINGGTQTVQNYGKAINTDIVSGLQQIMANGTAEGSIINGGSQVVNEGGLAENSVLNDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        YG--KDVGTVLNSAGTQTIYASATSDKANIKGGKQTYYGLATEANIESGEQIVDGGSTEK 707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YSLKKDL-TDLTSVGTEKLSFSANSNKVNITSDTK---GL----NFAKKTAETNGDTT-- 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KKGVLTAGTI---TLKAGDNLKIKQNTNENT---NASSFT------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6.2%; Score 187; DB 1; Length 1569; 20.7%; Pred. No. 0.047; ative 87; Mismatches 262; Indels 23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----IGSTLTDTLLNTG-----ATTNVTNDN 205
                                                                                                                                                                                          ----TNVAQLKGVAQNLNNHIDNVDGN 519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels 232;
                                                                             1215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               767
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            930
                                                                                                                                                                                                                                                                                                                                                       448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  35;
```

Search completed: July 3, 2002, 08:30:02 Job time: 1173 sec